



FRIDAY, JANUARY 27, 1899

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Contributions.

Signal On and Off.

New York, Jan. 21, 1899.

To the Editor of the Railroad Gazette:

Referring to the letter of C. C. Anthony and your editorial on same in issue of Jan. 20, the normal position of all signals is at danger; the clear position is reversed, and in speaking of the manipulation of same, we use the words "normal" and "reverse," and if there is any question about the designations to indicate the position of the signal, why not use the words "normal" and "reverse?"

CHARLES HANSEL.

L. C. L. Freight.

To the Editor of the Railroad Gazette:

Just one word more in explanation of the proposition to establish independent package companies for the movement of L. C. L. freight. The problem may be a "tough" one, but the proposal is made to clear the ideas quite as much as anything else; for what "T. T." says as regards actual practice may be very true. It would seem, however, that the water transportation of Great Britain, say, is not more distinctively a cheap form of transportation than is or will be the railroad transportation of this country, and when we try to combine with it, under the same organization and methods, the quick railroad freight transportation of, say again, Great Britain, we get a nondescript service which is not altogether satisfactory. If a separation can be by organization the plan will separate the carload way freight train, say, from the package way freight train, which can be amply manned and run at high speed, and it will concentrate freight terminals and increase carloads. It will also, perhaps, lead to a similarity of rates for L. C. L. and C. L. freight service between large centers and transfer points. For instance, a shipment from Oneida, N. Y., to Geneva, Ill., could be moved by package company all the way, or by package company to Syracuse, by freight to Chicago, and by package company again to Geneva, just as shipments are now made part of the way by freight and part of the way by express, with undoubtedly advantage to business interests. Separate organizations for (1) fair rates and ordinary service; (2) fair rates and good, convenient service; (3) high rates and express speed, would possibly do much toward fixing the ideas of the public, and the railroads as well.

X.

The Gas Tank Failure in New York.

New York, Jan. 14, 1899.

To the Editor of the Railroad Gazette:

Mr. Rae, in a letter published in your issue of the 6th inst., states that "a simple calculation will show" that the tank will be 2 in. larger in diameter when filled than when empty. The modulus of elasticity of steel of this character is about 29,000,000 lbs. Taking the bursting strain at the bottom of side of tank, and assuming that it is unsupported by the bottom angle or bottom plates, the enlargement of the tank would be less than 1 in. in diameter, instead of 2 in. as stated, and under the actual conditions probably not $\frac{1}{2}$ in.

It is true that the strength of the bottom plates would be theoretically sufficient to prevent even this

enlargement at the bottom of sides, and that the latter will be more or less taper from the bottom outward, but as all strain produced by this distortion is within the elastic limit of the material, it would not cause the destruction of the tank. All steel tanks with flat bottoms are, and must necessarily be, subject to this strain.

The novel theory which is advanced, almost axiomatically, that a cylindrical water tank requires buttresses to prevent the sides from bulging out, is not borne out by experience, and I would refer Mr. Rae, or anyone interested, to numerous examples of other gasholder tanks in New York, and also to oil tanks and water-works tanks all over the country, and I may mention that it has never yet been found necessary to put buttresses or braces on the sides of large cylindrical marine boilers with flat heads, which heads are much thicker and more unyielding than the bottom of a gasholder tank.

The statement that "the weight of the superstructure, together with the wind pressure on it, alone would have been sufficient to render the entire structure unsafe" is not true, but I must confine myself to making this general denial here, without going into the voluminous calculations to prove it.

Neither is it true that "the lowest plate was subjected to a shearing stress, due to being rigidly fastened to an unyielding bottom plate, and to a vertical stress due to upper works, neither of these stresses being provided for. The unyielding bottom plate referred to is $\frac{3}{8}$ in. thick, riveted with a single row of $\frac{1}{4}$ -in. rivets, $\frac{2}{3}$ in. centers. The bottom plate of side is $1\frac{1}{2}$ in. thick, and the "heavy angle" before referred to, which connects the $\frac{3}{8}$ -in. bottom plates with the $1\frac{1}{2}$ -in. side plates, is 5 in. x 5 in. x $\frac{3}{8}$ in. If any criticism can be made of this "heavy angle," it is that it is not heavy enough, but outside of this and some other minor details, I fail to see that "the plans show either 'incompetence or carelessness' in the design of the tank."

The dimensions above given were taken from the original specifications, but have not been verified by actual measurements in every case.

ROBERT W. PROSSER.

New York, Jan. 18, 1899.

To the Editor of the Railroad Gazette:

The constants assumed, together with uncertainty as to exact thickness of plates at the time of writing, gave a larger increase in diameter than those used by Mr. Prosser. With a stress of only 13,000 lbs. per sq. in., the enlargement would be 1 in. very nearly, with the above assumed modulus. I used 20,000 lbs. per sq. in., founded on the statement of an official of the gas company, and in the absence of certainty as to thickness of plates. Twenty-four million lbs. was used as modulus, from Carpenter's "Experimental Engineering." The effect of temperature is not included.

Granting that this least possible enlargement of 1 in. is nearer than the 2 in. found before, the bottom angle and plates do not decrease, except close to the bottom. If the connection angle and bottom plate are practically unyielding, then the normal diameter of the tank under pressure is 1 in. greater than where held at bottom. Over what vertical distance was this difference distributed, that is, what was the rate of "more or less taper" admitted above? It cannot be calculated, and a powerful, unknown shear is introduced, which must be resisted by the $\frac{3}{8}$ -in. rivets holding the 5 in. x 5 in. x $\frac{3}{8}$ in. angle to the $\frac{3}{8}$ -in. bottom plate, or by the $\frac{3}{8}$ -in. rivets in the joints of the same. On the north side of the tank the effect of the wind pressure put these rivets in tension as well. These rivets, as an inspection of the wreck will show, sheared off almost entirely round the circumference of the tank, as formerly described.

The statement, "As all strain produced by this distortion is within the elastic limit of the material it would not cause the destruction of the tank," is rather dogmatic. As the stresses due to the distortion produced by the constraining effect of the bottom angle and plate cannot be determined under the conditions, that part of the criticism is not well founded, it being a well established principle of design never to allow large unknown stresses to exist at a vital point without providing for them by separate members, or at the least by increasing the factor of safety at the weak point. I will show that the heavy angle did not provide for this stress.

The "novel theory advanced" is believed to be in accordance with the best practice, this tank being a departure, apparently, for economy. To prove this statement, it will only be necessary to take a glance at the large gas holder at Sixteenth street and East River, which has a water tank about the same height above the street as the destroyed one. The buttresses on this are massive structures, evidently designed as buttresses in addition to acting as columns. They spread out, being, perhaps, 6 or 8 ft. wide at the surface of ground, while the brackets on the destroyed tank ended some 8 ft. from the bottom, as shown in the sketch accompanying the article.

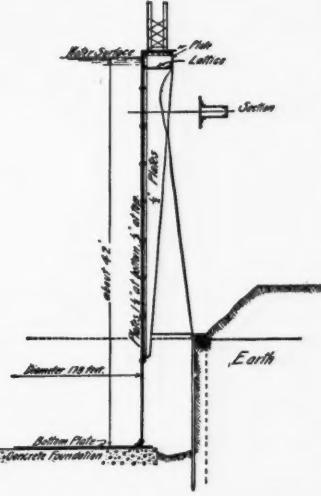
The comparison of the marine boiler to a water tank of this size is profitable, but not as a criticism. Gussets, or braces, are quite usual and necessary, although not on the outside, and act as buttresses,

though not so designed. Furthermore, the thickness of a boiler 16 ft. in diameter would be about 1 in., and if this ratio of thickness to diameter were the same in the tank, buttresses would, indeed, be unnecessary. The tank reduced to the diameter of the boiler mentioned would have an average thickness of about .09 in. Where flanged heads are used in boilers, the radius of curvature gives a degree of elasticity not found in the heavy angle connection of the tank; an elastic connection on this principle would have been better design.

No calculation could demonstrate the safety of this structure as built, with the whole weight of tank and superstructure supported on the unbraced, unstiffened part of sides, as shown in the sketch accompanying my original article. The only excuse for such a design is that it might have been the intention to rely on the support of some sort of filling between outside of tank and wall of pit to resist wind pressure, this filling to be done before letting water into tank. This can be determined from the plans.

In speaking of the bottom plate, described as unyielding, the statement is made, apparently to show that it could yield, that a single row of $\frac{3}{8}$ -in. rivets at $2\frac{1}{2}$ -in. centers was used at the joints. The fact is that this plate did yield at one place, but only by shearing the rivets in a seam near the north side parallel to Twenty-first street, and thereby proving that a serious shearing force, unprovided for, was developed by this plate's inability to yield to the increased diameter.

To show that the lowest plate was subjected to the stresses mentioned, it is only necessary to examine the sketched section in the former issue, where it will be seen that the unsupported plates between the

Buttress of 16th Street Tank Shown in Light Full Line to Right of $\frac{1}{2}$ -in. Plates.

Part Section of Retaining Tank.

lower end of bracket and bottom plate had to carry the weight of the column with its share of superstructure and wind pressure, giving the vertical stress, the tension longitudinally due to pressure, and the shear at lower edge due to inability of bottom plate to yield sufficiently to take the larger diameter.

The statement is made that, if anything, the connection angle was not heavy enough. In what way would increased weight in the angle have added to the strength where a $\frac{3}{8}$ -in. angle was used simply to connect the side plate with the $\frac{3}{8}$ -in. bottom plate, using a single row of $\frac{3}{8}$ -in. rivets?

The fact is also worthy of note, that this connection angle was on the inside, thus subjecting the rivets in the vertical leg to pure tension.

Without going into further details, I think that the part of the side plates immediately under the columns has been shown to have been subjected to two stresses for which no provision was made, in addition to the stress due to hydrostatic pressure.

It has been indicated that the only visible resistance to the wind effects was rigidity of the water tank as a cylinder. Does Mr. Prosser wish to be understood that he believes this was safe economy and good practice?

Taking the suggestion made as to other gas tanks in New York, I examined carefully the tank at Sixteenth street mentioned above, and found it to have about the same height from street level to top of reservoir as the one under discussion, although only extending about 6 ft. below ground, with open space all round, so that the foundations of buttresses were visible. These foundations were in one with the main foundation, extending out about 7 or 8 ft. further, the foot of buttresses being securely fastened to the masonry. The general form of these buttresses is shown approximately to scale in the accompanying cut, the depth of this tank below ground being 9 or 10 ft. less than the other. It will be noted that the bottom of the buttresses of the Sixteenth street tank has nearly twice the depth of the top of the one that failed. Such buttresses and extra foundations were considered necessary for the Sixteenth street tank,

but in the other were entirely absent. What principle was used to prove them unnecessary in this case the designer alone can say. GEORGE RAE.

New York, Jan. 19, 1899.

To the Editor of the Railroad Gazette:

Mr. George Rae, M. E., in a paper in your number of Jan. 6, clearly sets forth what was abundant cause for the recent memorable gas holder failure in this city. A casual inspection of the collapsed structure and of what has appeared of its design will confirm Mr. Rae's conclusion that the failure was due to inadequate bracing, and most of all to inadequate provision for support of the guide frame.

never changing one. The pressure of gas in the holder can never increase the tank pressure further than to overflow line of the water, except in case of an explosion in the holder. This latter is extremely improbable, if not practically impossible, in the regular use of the holder. The theory of explosion to account for the failure under discussion is not for a moment tenable.

W. H. BREITHAUPT.

Recent Freight Car Body Bolsters of the Chicago, Rock Island & Pacific.

In connection with what we have lately published on the subject of freight car body bolsters, the excellent designs in malleable iron and cast steel now

similar to that of other roads; after a very little service the cars ride upon the side bearings. For this reason, during the summer of 1896, the question was taken up of designing a stronger body bolster, which would conform to the space limits of the standard 60,000 lbs. capacity box car of that road, and this investigation resulted in the malleable iron bolster shown in Fig. 1. It will be seen that this is a cast bolster, weighing 445 lbs., which is peculiar in having heavy lugs outside the intermediate sills, and equal in height to the sills, the tops of the lugs being joined by a $\frac{3}{4} \times 8$ -in. plate above the sills. The bolster thus becomes a truss in so far as the loads from the side sills are transmitted by the tie-plate and lugs to points in the bases of the lugs, thus reducing the lever arms of the outer loads considerably more than one-third. In effect this is the same, provided the end connections of the plate are such that it properly acts as a tie, as if the outer loads were applied to the ends of a short bolster not extending beyond the lugs. It will also be noted that the side bearings and center plate are cast with the bolster, while the truss rod supports are separate castings secured by bolts. A patent covering this type of bolster has lately been granted to Mr. Gustav A. Akerlind, Chief Draughtsman of the Chicago, Rock Island & Pacific, and his assistant, Mr. J. J. Carroll. (Patent No. 609,323.)

The first two bolsters of this design were made for test by the National Malleable Castings Co., Chicago, and were placed under a car together with very rigid malleable iron truck bolsters of the box type.

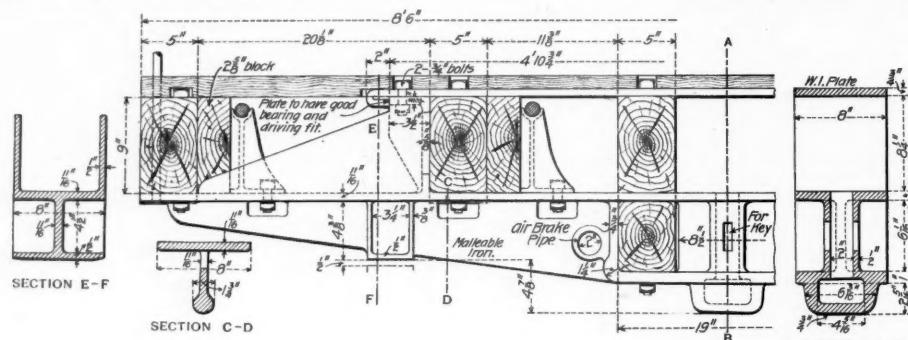


Fig. 1.—Malleable Iron Body Bolster for 60,000 lbs. Capacity Box Cars—C., R. I. & P. Ry.

In following Mr. Rae's general analysis I come, however, upon a statement which has tempted me to make a few simple figures. It is stated that the water tank under pressure would be about 2 in. larger in diameter than when empty, that the lowest plate was held by its rigid connection to the bottom, and the top plate by an encircling stiffening girder, and that "the consequence of this constraint at top and bottom would evidently be to throw a greatly increased stress on the intermediate plates." Why so, if the superimposed guide frame is not to be considered?

The hydrostatic pressure at any point in the side plates, and the corresponding stress at that point, is due, not to whether there is more material to resist a like, or greater or lesser stress at any other point, but to the height of water in the tank above the point considered. Taking $\frac{1}{2}$ in. thickness of plate at 5 ft. from the top of the tank under discussion, 1 in. thickness at mid height, and $\frac{1}{2}$ in. at bottom, and taking the modulus of elasticity of the material at 29,000,000, stresses from the hydrostatic pressure under full tank would be approximately—I have minute decimals, but, like the authors of The Wrong Box, I scorn to give them—4,700 lbs. per sq. in. at 5 ft., 9,800 mid, and 13,000 at bottom, and increase in diameter $\frac{1}{2}$ in., $\frac{1}{4}$ in. and 1 in. respectively, half of which values would be the movement on either side. The unit stress at net section of connection of a plate would be materially larger than those given, which are for the body of the plate and determine its elongation.

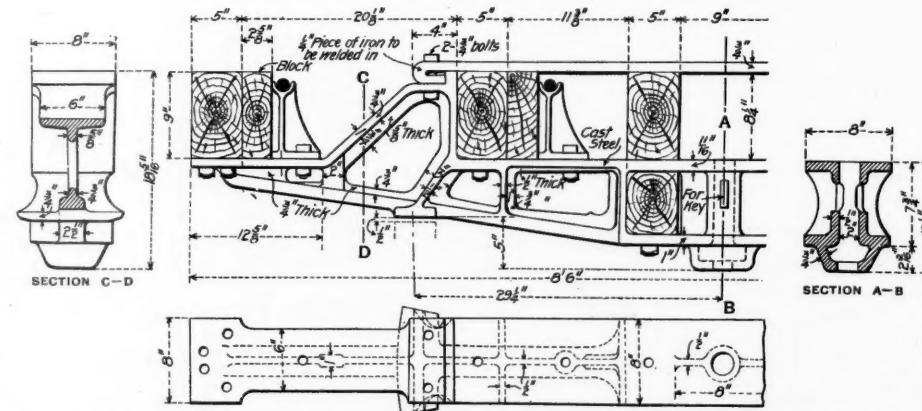


Fig. 2.—Cast Steel Body Bolster for 60,000 lbs. Capacity Box Cars—C., R. I. & P. Ry.

in use on the Chicago, Rock Island & Pacific are of unusual interest, in that they provide ample strength for cars of 60,000 and 80,000 lbs. capacity, with possibilities for stronger bolsters being built along the same lines; they are interchangeable with the shallow strap bolsters formerly used by that road, and can be removed from a car as readily as the usual metal bolster built up of plates. These features are not only important in bolsters for new cars, but, as has

This car was then loaded with 80,000 lbs. of old car wheels and shifted about through the shop yards until it was evident that the bolster had sufficient strength. A number of these were then ordered and applied to cars; in fact, from that time on the making of the common built-up plate bolsters for 60,000 lbs. capacity cars has practically ceased at the Rock Island shops.

In the summer of 1897 200 box cars were built by contract, and the malleable iron body bolsters specified. A test of one of these bolsters, made at that time, showed the ultimate strength to be 150,000 lbs. The first car so equipped was also called in and examined, and, although it had been in constant service for eight months carrying grain, there was no deflection of the bolsters which could be measured, and the car was again put in service.

In the summer of 1898, on account of the makers of malleable iron not being able to promptly fill orders for heavy castings, it was decided to substitute cast steel for the malleable iron, and the design of bolster shown in Fig. 1 was modified by the American Steel Foundry Co., St. Louis, as shown in Fig. 2. This cast steel bolster, upon test, proved to be not quite so strong as the one made of malleable iron, but as the margin of strength was still large, the design was not altered. The Rock Island now has about 1,000 box cars with the steel body bolsters, and

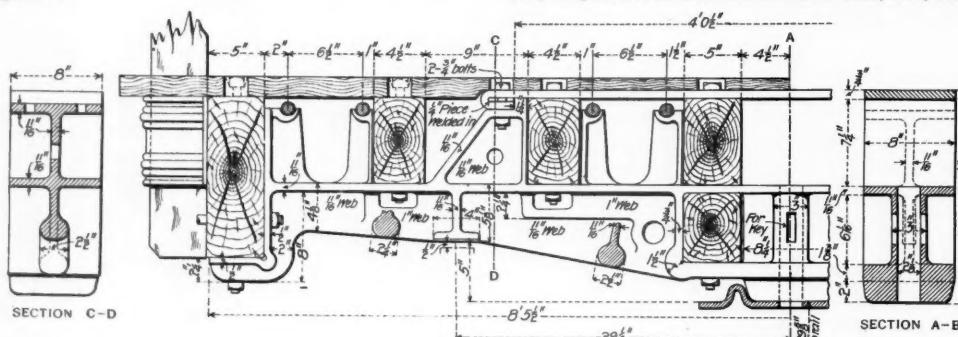


Fig. 3.—Cast Steel Body Bolster for 80,000 lbs Capacity Coal Cars—C., R. I. & P. Ry.

Shearing stresses exist to a greater or less extent in any tank made of plates. In this case they were not so large but that the elasticity of the material could well take care of them. If the first rupture took place at the bottom of the tank, it was what was logically to be expected, as the stresses were there greatest, both from hydrostatic pressure and bending. Rupture at the point of greatest stress must be allowed to be to a certain extent an indication of general fair material and workmanship. Had the box brackets, of $\frac{1}{2}$ -in. plates and four corner angles, been properly attached to the tank and extended to its bottom, their stiffness would have greatly increased its stability. They were fairly well riveted up, but were only flimsily bolted to the tank, the bolts being spaced 2 to 3 ft., and not riveted as Mr. Rae indicates.

On designing a gas holder, one is apt to be surprised, looking into what has been done, to find with what little margin for stability work of this class is put up and stands well. And the margin does not need to be large, as wind pressure is the only force to provide for differing from an absolute static and

previously been pointed out, are absolutely essential where it is desired to renew the bolsters of old cars with those of sufficient stiffness to prevent deflection and the consequent carrying of the load at the side bearings.

The experience of the Chicago, Rock Island & Pacific with the ordinary strap body bolsters has been

about 500 box cars with the malleable iron bolsters shown by the engravings. A number of palace stock cars are also fitted with similar malleable iron bolsters, designed to suit the car framing, and involving the same principle as shown in Fig. 1.

Fig. 3 shows a bolster intended for 80,000 lbs. capacity coal cars, to be made of cast steel, which is

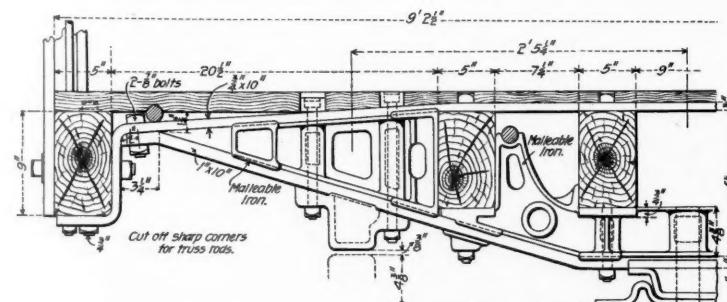


Fig. 4.—Body Bolster for 50-ft. Furniture Car—C., R. I. & P. Ry.

also suited to the framing and draft rigging of the present 60,000 lbs. capacity coal cars. By lowering the side bearings and truck bolster a more desirable shape of the lower portion might be obtained, but it could not be done in the present instance and be interchangeable with the bolsters of the present equipment. It will be noticed that the side sills are well secured by bolts through the upper flanges of the bolster so as to prevent any outward tilting of the sills, and that this design provides for the truss-rod supports, as well as the center plates and side bearings, being cast with the bolster.

The built-up bolster shown by Fig. 4 was recently used for some low 50-ft. furniture cars, and the construction is clearly explained by the engraving. The chief feature is that the intermediate and center sills and the inner truss rods are supported by a malleable iron bridge casting, which thus relieves the lower member of the bolster truss of a portion of the load. The depth of the truss is also increased by moving in the intermediate sill and placing the top plate above the sills. As previously stated, all of these bolsters have been so designed as to be interchangeable with the old wrought iron built-up bolsters, and not to interfere in any way with the standard car framing of the road or with the standard truck and truck bolster.

We are indebted to Mr. Geo. F. Wilson, Superintendent of Motive Power, and Mr. Akerlind for information and drawings.

Senator Depew.

Hon. Chauncey M. Depew, Chairman of the Boards of Directors of the New York Central & Hudson River and the other Vanderbilt railroads, was last week elected to the United States Senate by the Legislature of the State of New York, for the term of six years from March 4 next.

At a dinner given to Mr. Depew by the Republican Club, New York City, on the evening of January 18,

lished, they had nothing but commendation for American railways. They recommend the adoption of many of our methods, as being superior, not only to those in vogue in Germany, but also to those of any other country.

"The budget of the Russian Empire for 1899, made public this week, discloses the almost incredible efforts in railway extension that the Imperial Government of the Czar is putting forth. This year alone 109,000,000 roubles will be devoted entirely to the railways, and during the past 12 years 425,000,000 roubles have been thus expended. The immense sum which the Russians are devoting to the extension of their railways entirely overshadow the demands of both the army and the navy.

"The two men who are nearest to the Czar of Russia are M. Witte, the Imperial Minister of Finance, who 16 years ago was a station agent at a small station on one of the railways of Russian Poland, and Prince Michel Hilkoff, who 40 years ago was learning the trade of a mechanical engineer on an American railroad, and is to-day the Imperial Minister of Ways and Communication of the Russian Empire, and one of the Cabinet of the Czar.

"Before the railroads were built, it took a week to go from New York to Buffalo, nearly three weeks from New York to Chicago, and no one would have thought of taking a trip from New York to the Pacific Coast, except a few of the hardest pioneers. To-night, if you place a letter on the Pacific and Oriental mail train, which leaves New York at 9:15, you may be sure that your correspondent in San Francisco will be reading it Sunday night—four days from New York. The framers of our Constitution would have considered a man entirely beside himself who would have suggested such a possibility.

"If we may judge by the record of Chauncey M. Depew as President of the New York Central, we may feel sure that the best interests of the state will have careful consideration at his hands as Senator. I have never brought before Mr. Depew a proposition for the improvement of the service of the New York Central that he has not given the matter the fullest and most careful consideration, in the light of the rights of the public, as well as those of the carrier."

American Society of Civil Engineers.

The annual meeting of the American Society of Civil Engineers was held in New York City last week, according to the programme already announced. The

national Engineering Congress to be held during the Paris World's Fair in 1900, which was referred to the Board of Direction, and Mr. Willard A. Smith spoke on the matter of an engineering exhibit at that fair.

A resolution was introduced designed to bring about the discontinuance of the custom of using the 24-hour notations in the publications of the Society. This resolution was defeated, as was the case last year, but a resolution was passed requesting the Committee on Standard Time to present a final report at the next annual meeting.

The announcement was made that the summer convention will be held at the Stockton Hotel, Cape May, N. J., June 27 to 30.

The programme for this meeting included excursions Wednesday afternoon to the New East River Bridge and to the docks, piers and bulkhead wall of New York City; a reception and dance at the Society House on Wednesday evening; an excursion to the Crescent Shipyard and the New York Navy Yard on Thursday, a lecture at the Society House in the evening by Mr. E. Wegman on the "Old Roman Aqueducts" with stereopticon views; a smoker after this lecture, and finally an excursion on Friday to the new Croton dam. All of this programme was carried out, with great pleasure and profit to the members, we have no doubt.

Northern Pacific Compound Consolidation Engine.

The engraving, from a photograph, shows a compound consolidation locomotive recently built by the Schenectady Locomotive Works for the Northern Pacific. It is one of a lot of 14 known as the class "Y." It will be observed that this is another one of the very powerful engines of which so many have recently been turned out. This one carries 84½ short tons on the drivers, and has cylinders 23 in. and 34 in. diameter by 34 in. stroke, and the steam pressure is 225 lbs. The total heating surface is 2,923.4 sq. ft., and the grate area 35 sq. ft. The descriptive specification follows:

Compound Consolidation Locomotive—Northern Pacific RR.

Weight in working order.....	189,200 lbs.
" on drivers.....	169,000 lbs.
Wheel base, driving.....	14 ft. 8 in.
" total.....	23 ft. 3 in.
Diam. of cylinders.....	H.P. 23 in., L.P. 34 in.
Stroke of piston.....	34 in.
Horizontal thickness of piston.....	4½ in. and 5½ in.
Diam. of piston rod.....	3½ in.
Kind " " packing.....	Cast-Iron
" " rod packing.....	Jerome
Size of steam ports.....	H.P. 18 in. x 1½ in., L.P. 23 in. x 2½ in.
" " exhaust ports.....	H.P. 18 in. x 3 in., L.P. 23 in. x 2½ in.
" " bridges.....	1½ in.
Slide valves.....	Allen-American
Greatest travel of slide valves.....	6 in.
Outside lap.....	H.P. 1½ in., L.P. 1 in.
Inside " " ".....	¼ in.
Lead of valves in full gear.....	½ in. blind
Kind of valve stem packing.....	Jerome
Diam. of driving wheels outside of tire.....	55 in.
Mat'l of barrel and outside of firebox.....	Cast steel
Tire held by.....	Shrinkage
Driving box material.....	Main, cast steel, I. F. & B. steamed cast-iron
Diam. and length of driving journals.....	Main, 9 in. diam., I. F. & B. 8½ in. dia. x 10 in.
Diam. and length of main crank pin journals.....	Main side, 7½ in. x 5½ in.; 6½ in. dia. x 6 in.
Diam. and length of side rod crank pin journals.....	Inter, 5½ in. x 5 in., F. & B., 5 in. dia. x 3½ in.
Engine truck, kind.....	2-wheel swing bolster
" " journals.....	6 in. dia. x 11 in.
Diam. of engine truck wheels.....	30 in.
Kind of engine " " ".....	2-wheel swing bolster
Style of boiler.....	Extended wagon top
Outside diam. of first ring.....	72 in.
Working pressure.....	225 lbs.
Mat'l of barrel and outside of firebox.....	Carbon steel
Thickness of plates in barrel and outside of firebox—	½ in., ¾ in., 1½ in., ¾ in., ½ in.
Horizontal seams—Butt joint sextuple riveted, with welt strip inside and outside.....	Double riveted
Circumferential seams.....	120 ft. ½ in.
Firebox, length.....	42 in.
" width.....	F., 77 in.; B., 73½ in.
" depth.....	15.3 sq. ft.
" material.....	Charcoal iron No. 12
" number of.....	230
" diameter.....	2½ in.
" length over tube sheets.....	14 ft.
Fire brick, supported on.....	2 water tubes
Heating surface, tubes.....	2,705.2 sq. ft.
" " F. tubes.....	15.3 sq. ft.
" " firebox.....	202.9 sq. ft.
" " total.....	2,223.4 sq. ft.
Grate " style.....	35 sq. ft. Rocking Co.'s standard
Ashpan.....	Hopper, dampers F. & B.
Exhaust pipes.....	Ordinary
" nozzles.....	5½ in., 5½ in. and 5½ in. dia.
Smokestack, inside diameter—	18½ in. at top and 16 in. near bottom
" top above rail.....	15 ft. 0 in.
Boiler supplied by one Hancock inspirator, type A; one Ohio injector, standard A	Tender.
Weight, empty.....	44,850 lbs.
Wheels, number of.....	8
" diam. and length.....	33 in.
Journals.....	5 in. dia. x 9 in.
Wheel base.....	15 ft. 8 in.
Tender frame—	10-in. steel channel
" trucks—Center bearing, double I beam bolster, with side bearings on back truck.	
Water capacity.....	5,500 U. S. gals.
Coal ".....	8 tons
Total wheel base of engine and tender.....	51 ft. 9½ in.
Special Fittings	
Engine equipped with—	
Three 3-in. Ashton safety valves.	
McIntosh blow-off cock.	
Detroit cylinder lubricator.	
American outside equalized brake on all drivers, operated by air.	
Westinghouse air-aut. air brake on tender and for train; 9½-in. air pump.	
Magnesia sectional lagging on boiler and cylinders.	
Gollmar bell ringer.	
Ashcroft steam gage.	

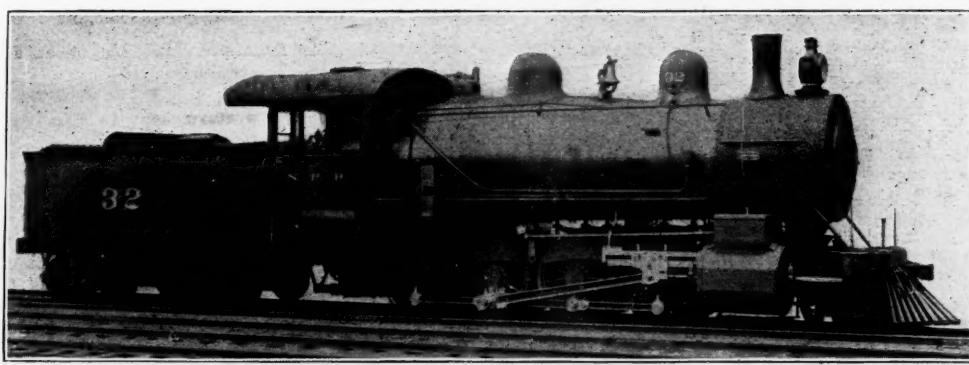
Some interesting facts are given about the use of the new house, which has been open since Dec. 16, 1897, every day except Sundays, between the hours of 9 a. m. and 10 p. m. On Sundays the house has been open between 2 p. m. and 7 p. m. The total attendance at the house, exclusive of those attending the meetings, has been 2,401, and the attendance in the reading-room shows an increase of 91 per cent. over that of the year 1897. Work on the reclassification and indexing of the library goes forward, and the new index for the largest section in the library, that of Railroads, is nearly complete. This index now contains 3,106 titles.

The permanent loan on the new house has been fixed at \$85,000, placed at 4½ per cent. interest.

The Board announced that the Norman medal for the year ending with July, 1898, was awarded to Mr. B. F. Thomas for his paper on "Movable Dams." The Rowland prize was awarded to Mr. Henry Goldmark for his paper on "The Power Plant, Pipe Line and Dam of the Pioneer Electric Power Company at Ogden, Utah." The Collingwood prize for juniors was again not awarded.

A progress report was made by Prof. George F. Swain for the special committee on Tests of Cements, and Mr. Sanford Fleming sent a letter of considerable length on the work of the Committee on Standard Time, although this was not intended as a formal report. Mr. Fleming suggested that the committee should be discharged before long.

Mr. Corthell brought up the subject of an Inter-



Schenectady Compound Locomotive—Northern Pacific Railway.

Mr. Depew, in response to the congratulations of his friends, said, among other things:

"I enter upon my duties free from pledges. I have no obligations of any kind, except to meet, to the extent of my ability, the expectations of my constituents and to promote the welfare of the country and of our state. I will except only the gratitude which I feel toward my political friends, whose loyalty and love have been so conspicuously and gratefully my best possessions these many years.

"I believe that every company which owes its existence to a charter from the state or the national government should be subject to the most rigid scrutiny and supervision by the state or national government. I believe that the Interstate Commerce Commission should be strengthened in its power, its discretions and its judicial dignity. It is one of the elements which is rapidly solving the railway problem, that no interest or combination of interests any longer controls a majority of the stock of our great railway corporations."

Mr. George H. Daniels, General Passenger Agent of the New York Central, made a speech at the dinner, from which the following paragraphs are taken:

"It is peculiarly fitting that just at this time, when transportation is occupying so large a place in the public mind, the Empire state should select as its representative in the most important legislative body in the world a man whose whole life has been spent in the closest association with the transportation interests of the country. From my boyhood I have been identified with transportation interests, and for the past 10 years I have been intimately associated with Senator Depew. I believe his election marks a new era; an era of better understanding and closer and more amicable relations between the great commercial, agricultural and industrial interests, and the transportation interests. This event comes with peculiar significance in the same week that two of the imperial governments of Europe have given to the world their indorsement of the idea that modern transportation facilities form one of the surest bases upon which to build and sustain a government.

"The Emperor of Germany, in his speech to the Prussian Diet day before yesterday, did not lay the greatest stress upon the necessity for increasing the army, or for the construction of additional ships for the navy, but upon the great importance of extending the railroads and the navigable canals. An imperial German Commission was sent to the United States a short time ago for the purpose of examining American railways, and in their report, recently pub-

The Building of the Trans-Caspian Railroad.

"Railroads as a Means of Penetrating New Countries" is the title of an article recently written by General Annenkov and published in the November Bulletin of the International Railway Congress. General Annenkov was the Commander of the forces of the Russian army that built the railroad. The line begins on the east coast of the Caspian Sea, at Mikhailovsk, passes through Ashkabad, 280 miles; Merv, 496 miles; Tcharjui, on the Oxus River, 650 miles, and Bokhara, 718 miles, to Samarcand, 885 miles. Most of the facts given by General Annenkov were published in the Railroad Gazette at the time the road was built, but his present sketch has many points of interest, nevertheless. He gives some interesting notes concerning the exploration of the desert country preparatory to building the railroad, and also concerning the methods pursued in the construction of the line. The measures taken for preserving the health of the workmen are of particular interest; and the marked success of the means adopted may perhaps suggest to some American readers a lesson in civilization which this country can find in the example of so-called half-civilized Russia.

The vast desert, sandy and almost uninhabited, stretching between the Caspian and the Aral seas, was the home of predatory tribes of horsemen, who made frequent warlike raids on the towns near the desert. The Government decided to exterminate or bring under control these wild tribes, but there was difficulty in conveying the troops and in getting supplies to them. The dromedary travels only 3 kilometers (1.86 miles) an hour, and consequently delays the progress of troops. Troops, both infantry and cavalry, need to rest about once in 8 miles, but it is not worth while to stop the dromedary so often unless its pack is taken off. This and other difficulties led to the decision to build a railroad, and a length of 240 kilometers (149 miles) was finished in 1881. In 1885 it was decided to extend the railroad to the Oxus, and that year 840 kilometers (522 miles) were built, finishing the road to the river and beyond to Samarcand.

The first thing necessary in building the railroad was to find water. Nearly all of the rain for the whole year falls between March 15 and April 15, but a good deal of the water filters through the sand and forms subterranean lakes, so that it is available for many months. The Persians have long drawn water from these lakes for the use of towns and villages. The builder of the railroad, profiting by this example, conveyed water by iron pipes, and many of the stations on the road are thus supplied, without pumping engines.

There is no fuel in the country. There are some bushes, but it would be criminal to use these for fuel, as the brushwood is the only thing that prevents the sand from swallowing up the whole country. For locomotives, therefore, a by product, left after refining petroleum, called massoute, is used. The same is used on steamers on the Caspian Sea. It takes only one-fifth as much room as does the coal necessary to furnish the same amount of heat. To guard the track from drifting sand the conical heaps of sand which abound on the plains were each covered with a cap, made of a bundle of fagots. Similar masses of plaited brush were placed at the edges of embankments and at the tops of cuts. The officers were soon surprised to see that the fagots on the barkhanes (cones) sprouted, evidently because there was water beneath the surface which had not been discovered. This sprouting made the vegetation permanent and the line has been completely protected from sand.

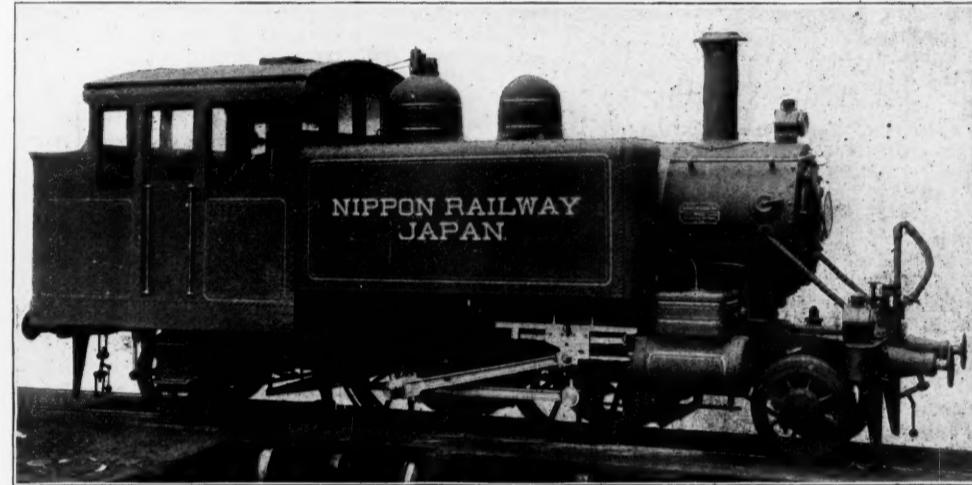
The population being scanty and laborers presumably scarce, the builder of the line sent to America for machinery, but, unexpectedly, large numbers of native laborers flocked in from long distances and offered their services, attracted by piece-work wages, and grading apparatus and steam shovels were little, if any, used. The Turcomans, working at piece-rate wages, are very efficient, being strong and sober and living on food that costs almost nothing. Elaborate preparations were made to carry forward material by the use of horses and dromedaries, but it was soon found that the better way was to lay the track as fast as the grading was finished and thus carry all material nearly to its destination on the cars.

The lodging cars of the construction train were made two stories high, and in general the most economical methods, such as American railroad builders are familiar with, were adopted. The train at the front consisted of cars for eating and sleeping, a hospital car, two cistern cars for boiled water, the office car and a dining saloon for officers, 50 cars in all. The forces were organized in battalions of 500 soldiers and 700 Persians, the latter doing the hardest work.

Each group of laborers was under the orders of a non-commissioned officer or of a soldier who thoroughly understood tracklaying. The tracklayers were divided into seven groups, and the size of the whole can be estimated when it is stated that the spikers numbered 40.

General Annenkov thinks that there is no country

in the world where the climate is more unhealthy than in this part of Central Asia. Awful fevers abound, and they come on very suddenly; the disease known as Peuda fever is common, as is Rechta. The rechta is a flat worm that burrows under the skin of the arm or leg. But all difficulties were overcome, and the percentage of men incapacitated through illness never rose above from three to five. The builder took along with him Prof. Kovalevsky, who is now Professor of Hygiene at the Warsaw School of Medicine, and hygienic science was rigidly applied at all times and all places. All the water used, both for drinking and washing, was boiled, most of it being distilled at the terminus of the road on the Bay of Mikhailovsk. When near the great rivers the water rule was relaxed. At all stations where locomotives were kept, Russian steam baths were put up so that every man could use one at least once a week. Care was taken that the food should be always fresh and varied, preserved vegetables being furnished in abundance. The Russians were allowed 2.7 lbs. of bread and 0.9 lb. of meat a day, exclusive of vegetables and groats. The native workmen, however, were paid monthly wages, including an allowance for food, and they seemed to live on a handful of rice and small rolls which they baked themselves out of meal supplied to them. On this fare they did the hardest work. Prizes were given to the soldiers who kept their cars most neatly, and also to the most efficient cooks. Barracks and cars were always kept clean and well aired. Orders were given that no one should go out after sunset without wearing a woollen garment, and care was taken that the order should



Suburban Locomotive for Japan.

be obeyed. From June 15 to Aug. 15 all work was suspended, and the soldiers, camped on high ground, were drilled and exercised every day.

A healthy moral discipline was maintained. The companies of workmen had a band with them and the men sang their national songs while at work. In general their minds were occupied, conditions were happy and work progressed marvelously. Often five or six miles of track were laid in a day. The natives lived on the best of terms with the soldiers.

Russia imports over \$12,000,000 worth of cotton annually, and one-half of this now comes from Central Asia; whereas before the railroad was built only an insignificant quantity was procured from that region.

Locomotives for Japan.

The Schenectady Locomotive Works have just completed 26 suburban engines for Japan. They are double-end, narrow-gage locomotives for the Nippon Railroad. The external appearance of these engines is shown by the engraving from a photograph, and the descriptive specification follows:

Double End Suburban—Nippon Railroad, Japan.	
Gage.....	3 ft. 6 in.
Fuel.....	Japanese bituminous coal
Weight in working order.....	86,700 lbs.
" on drivers.....	51,700 lbs.
Wheel base, driving.....	5 ft. 6 in.
" " rigid.....	5 ft. 6 in.
" " total.....	21 ft.
Diam. of cylinders.....	14 in.
Stroke of piston.....	22 in.
Horizontal thickness of piston.....	4¾ in.
Diam. of piston rod.....	2¼ in.
Kind " " packing.....	Cast-iron
" " " rod packing.....	Jerome metallic
Size of steam ports.....	12 in. x 1¼ in.
" " exhaust ports.....	12 in. x 2¼ in.
" " bridges.....	¾ in.
Slide valves.....	American balanced
Greatest travel of slide valves.....	.5 in.
Outside lap.....	¾ in.
Inside " " ".....	0 in.
Lead of valves in full gear.....	Line and line, front and back
Kind of valve stem packing.....	Jerome metallic
Diam. of driving wheels outside of tire.....	.56 in.
Mat'! " " " centers.....	Cast steel
Tire held by.....	Shrinkage
Driving box material.....	Steeld cast-iron
Diam. and length of driving journals.....	7 in. dia. x 8 in.
" " " " main crank pin journals.....	4½ in. dia. x 5 in.
" " " " side rod crank pin journals.....	4½ in. dia. x 5 in.
F. ¾ in. dia. x ¾ in. B. ½ in. dia. x ¾ in.	
Engine truck, kind.....	Two-wheel swing bolster
" " journals.....	5 in. dia. x 8 in.

Smith automatic vacuum brake, outside equalized.
Magnesia sectional lagging on boiler and cylinders.
Three headlights, with 8-in. bull's eye lens.
Two whistles—one 3-in. and one 4-in. Crosby No. 3
chime.

Long Island Railroad Improvements

On Friday evening of last week, Mr. J. Vipond Davies addressed the Brooklyn Institute on "Underground Rapid Transit and the Proposed Long Island Railroad Tunnel Between Atlantic Avenue and Lower Manhattan." A large audience attended the lecture, which was given at Polytechnic Hall, Brooklyn. Mr. Davis is the Chief Engineer of the Atlantic Avenue Improvement Commission, and is associated with Mr. Charles M. Jacobs in the Long Island tunnel project. He discussed the subject about as follows: First, brief history of tunnels, followed by a description of the methods involved. A description of the present plan for Brooklyn and New York City was then given, followed by examples of the benefits accruing from these improvements, and lastly, methods of working rapid transit lines were considered, with a comparison of the present proposition with existing methods and routes.

A part of the address was devoted to an explanation of the Long Island Railroad plans, with special consideration of the Atlantic avenue improvements. The general scheme may be familiar to the reader, but the details have only recently been put in shape. The plans provide, in brief, for an elevated structure along the present route east from Nostrand avenue to Howard avenue, where it will go underground again. Between Nostrand and Bedford avenues it is proposed to bring the tracks underground, running in a single tunnel under Atlantic avenue west to Flatbush avenue, and the route will then be under this avenue to its intersection with Fulton street; along and under Fulton to a station near City Hall Square; then under Fulton and Pineapple streets to the East River, crossing to the foot of Maiden Lane, in Manhattan, and passing under Cortlandt street to the North River, and thence to Jersey City, with two stations in Manhattan, one near the Second and Third avenue elevated on Pearl street, and the other near the Sixth and Ninth avenue roads.

for Fig. 1, it is evident that the maximum power of the locomotive has been correspondingly increased, and that the lines of power at constant cut-off will extend nearly straight for a longer distance before meeting the power limit curves. This shows that the present tendency to piston valves and large boilers produces results in perfect harmony with our theory, and in strong contrast with past practice of small boilers and valves.

The Hancock "Composite Inspirator."

The accompanying engraving shows the "Composite" inspirator lately put on the market by the Hancock Inspirator Co. of Boston, Mass., for use where it is desired to place both injectors on one side of the locomotive, or on the boiler butt. This device was first exhibited at the Master Mechanics' Convention at Saratoga, and has since been applied to about 40 new locomotives. The idea involved is to combine within one body two separate inspirators, which can be operated either separately or together, as desired. The "Composite" is made with the two inspirators of the same size, or of different sizes, as may be required, and an unusually wide range of capacity is thus obtained. The guaranteed capaci-

The viaduct begins to rise at the west line of Wazee street on 4½ per cent. grade and descends at Plat street on a 3.85 per cent. grade. It crosses several railroad yards, and the clearance allowed above railroad tracks varies from 20 to 24 feet. The spans across Cherry Creek are supported on posts in the center of the creek bed, which are embedded in steel cylinders sunk to a depth of about 20 feet to hardpan, and which are filled with concrete. Width of creek at the water line is 100 feet. The trestle portion of the viaduct is built in 20-foot, 25-foot and 30-foot panels. The Platte River is crossed on two spans, 102 feet each. These are riveted Warren girders. The total length of steel work is 2,576 feet; total earth embankment approaches are 2,084 feet long, making a total length of the viaduct of 4,660 feet. The main viaduct has 35-foot roadway and two 7-foot 6-inch sidewalks. The sidewalks are of stone flagging, and the roadway is of concrete and asphalt, supported on buckled plates. The approximate total weight of steel is 2,100 tons, exclusive of hand railing; the total cost, including right of way, engineering and legal expenses, will be a trifle over \$300,000. The material is soft steel in built members, and medium steel in I-beams and roadway stringers. The contractors are: Charles Connor, grading,

work in the round house. We are informed that such joints can be ground with this device in from 15 to 30 minutes, depending upon their condition.

Railroad Building in South Africa.

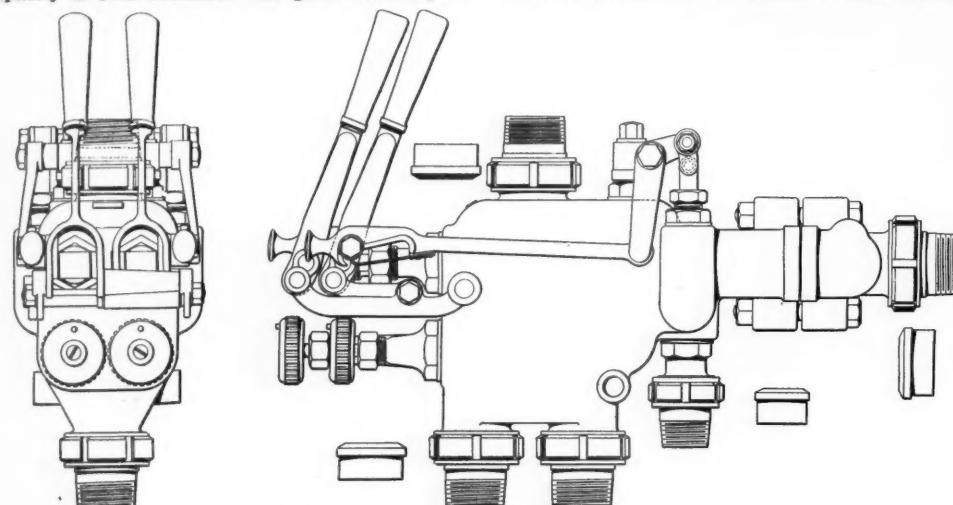
In previous articles on this subject* we gave only in a general way the new railroad building in the Orange Free State and Natal. We are now enabled to give it more in detail.

Orange Free State.

The map, which was drawn especially for the Railroad Gazette, through the courtesy of the Director-General, Mr. R. E. Brounger, shows clearly the present situation.

The existing lines, with the exception of a small piece of road running from Harrismith to the border line of Natal, are all under government control. The main line, extending across the state through Springfontein and Bloemfontein, was built by the Government of the Cape of Good Hope under concession from the Government of the Orange Free State, the latter reserving an option to buy the line when finished. Work was begun at the end of 1889 and finished early in 1892. In 1896 the Orange Free State exercised its right and bought the line. The object in building the road was to connect the parts of Cape Colony with the Transvaal gold fields at Johannesburg.

The branch lines now being built, as shown on the map, are from Winburg Junction southeast to Winburg; Wolverine southeast to Heilbron, and from Bethlehem east to Harrismith. Some work has also been done on the contemplated lines of the Government between Winburg and Clocolan, with branches from the latter town to Ficksburg and Ladybrand, and between Heilbron and Bethlehem.



Elevation of the Hancock "Composite Inspirator."

ties of the smallest and largest of these combinations when raising water at 75° F., through 3 ft. are given in the table, the 15 intermediate sizes having corresponding intermediate capacities.

Size.	Capacity Per Hour, Gallons.		Boiler pressure 125 lbs.	Boiler pressure 210 lbs.
	Minimum	Maximum		
Smallest.....	185	740	205	820
Largest.....	1,881	5,524	1,517	6,068

The minimum capacity is obtained when the smaller inspirator only is working with the feed reduced to the lowest point; the maximum capacity is given when both inspirators are in full operation.

All parts of the "Composite" which are subject to wear and which require renewal are interchangeable with the corresponding parts of the inspirators heretofore made by this company. A new feature, however, is the swing check valve placed in the delivery end of each inspirator in place of the horizontal sliding check commonly used. This swinging check has been found so much more reliable where the feed water causes rapid incrustation that a similar line check valve entirely separate from the inspirator has been designed and is recommended for use with all injectors; when the swinging line check is used the usual sliding check in the delivery end of the injector is removed. Both inspirators combined in the "Composite" type have the steam, delivery and overflow connections in common, and but a single main steam valve and boiler check is needed; in this way the cost of a set of pipe connections, a main steam valve and boiler check valve is saved. The inspirators of this new type, which are now in use, are reported to be giving very satisfactory service.

The Fourteenth Street Viaduct, Denver.

We are indebted to Mr. H. C. Lowrie, Engineer of the Department of Public Works, Denver, Colo., for the following information about an important viaduct building in that city, known as the Fourteenth Street Viaduct:

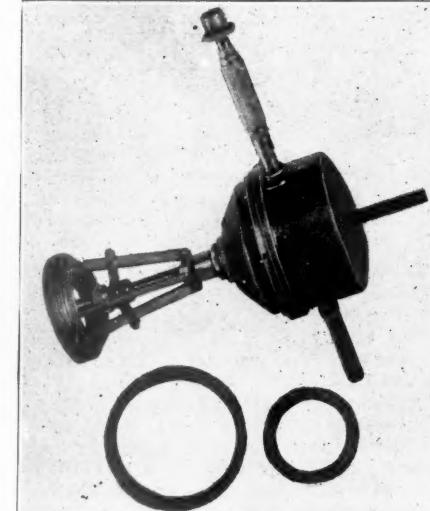
Bids were received for this work April 8, 1898, and contracts were awarded the latter part of May. The masonry is now completed and the erection of steel work has been begun. It will probably be ready for paving about April 1, 1899, and should be completed by the middle of June.

The viaduct begins at Fourteenth and Market streets, thence proceeds northwest one block to Blake street; thence southwest across Cherry Creek; thence northwest along the west bank of the creek, crossing the South Platte River and descending at Plat street. There are right angle approaches to it at East and West Wazee streets and Water street.

Denver; McGilvray Stone Co., masonry, Denver; John Gaffy & Co., foundations, Denver; Denver Paving Co., paving, Denver; Stewart Iron Works, hand-railing, Cincinnati; A. J. Tullock, steel work, Leavenworth. The steel is chiefly from Carnegie, and the shop-work by Pencoyd. The bridge was designed by H. S. Crocker, Assistant Engineer, who is in charge of construction.

A Chuck for Grinding Steam Pipe Joints.

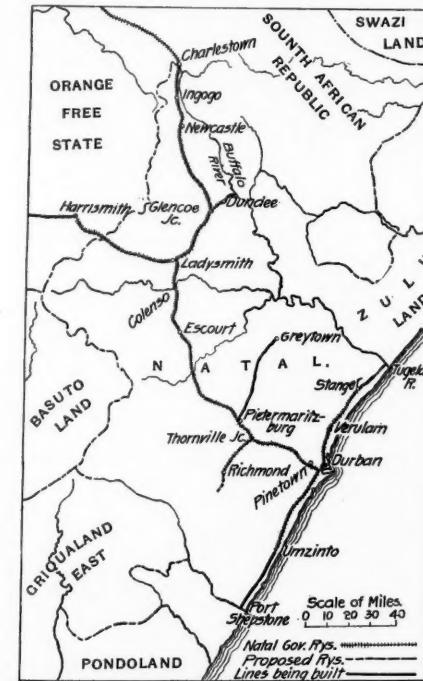
The Chicago Pneumatic Tool Co., Chicago, has brought out a convenient chuck for grinding steam pipe joints, which is used as an attachment to the Boyer compressed air drill. This chuck is shown by the accompanying engraving, and has three arms pivoted to a small frame, which in turn is fixed to a central shaft. The lower ends of this tripod engage the inner side of the grinding ring, so that when the arms are spread by the adjustable spider the



Boyer Motor Attachment for Grinding Steam Joints.

ring is clamped and made to turn with the chuck. The spider is adjusted along the threaded shaft by nuts, one on either side, which are also used to lock the arms in any position. The grinding rings can thus be of widely different sizes.

This attachment is made to fit into the ordinary chuck of the Boyer drill, and is intended for use especially in grinding the steam pipe joints in locomotive smoke boxes, both for new as well as repair



Sketch Map Showing Railroads in Natal.

At the time our last advices were sent, bids were about to be asked for building the lines from Springfontein northwest and Bloemfontein west to Kimberley, on the Cape Colony Government line, and Bloemfontein east to Ladybrand, and northeast, via Ficksburg, to Bethlehem, with a branch from a point between Bloemfontein and Ladybrand southeast to Wepener, and it is likely that they are now well under way.

The annual report of the Director-General of the Orange Free State Government Railways for the year 1897 gives some facts which are interesting. It was decided to relay the main line with new 60-lb. rails and use the old main line 46½-lb. rails for the branch lines. The new rails and fastenings were ordered from England. The bridge materials were bought in America.

In the fall of 1897, Messrs. Wm. Dunn & Co., of London, were appointed purchasing agents for the road, "with instructions not to confine their operations to the market of any one country, but to give manufacturers of repute in all countries the opportunity of tendering for supplies. As an indication that these instructions are being adhered to, it may be mentioned that purchases to the extent of upwards of \$35,000 have been made outside of Great Britain."

At the end of 1897 the Government owned 62 locomotives and 16 passenger and 652 freight cars. The number of persons killed was 10, of which six were passengers, three employees, and one other person; eight passengers and six employees were injured.

The Director-General has made a graphic freight rate schedule for use in preparing tariffs, a sample of which is given in an appendix to the report.

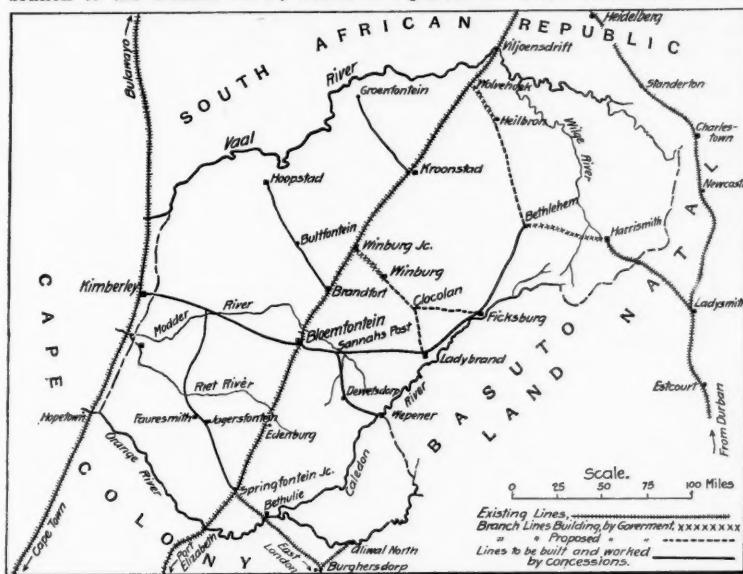
*See Railroad Gazette, August 19, 1898, page 592, and Sept. 9, 1898, page 642.

In it he shows 14 classes of freight and provides for finding at sight, the rate per ton per mile being known, the rate per 100 lbs. for any distance; and, conversely, the rate per 100 lbs. between any two places being known, the rate per ton per mile may be quickly found.

Natal.

The railroads of the colony of Natal, aggregating 487 miles working, are, with the exception of 33 miles from Verulam northeast to Stanger, belonging to the Natal-Zululand Railroad, owned and worked by the Colonial Government. These, together with the extensions proposed and building, are shown on the map of Natal accompanying this article. The Natal Government Railways also own 24 miles of road in the Orange Free State, extending from a point on the main line, near Ladysmith, across the Drakensburg Mountain to Harrismith, in the Orange Free State. Reference to the first map will show the extensions from Harrismith now being built and contemplated by the Orange Free State Government system.

The lines now under way, aggregating about 150 miles, are as follows: Extension of the Dundee branch to the Buffalo River, which is expected to



Sketch Map of the Orange Free State, Showing Railroads.

be working early in 1899; branch from Park Rynie, near Umtzinto, 60 miles south to Port Shepstone; a branch line 16 miles long from Thornville Junction to Richmond, tapping a rich agricultural district, and a branch line from Pietermaritzburg to Greytown, 65 miles, passing through a rich agricultural and stock district. The Natal-Zululand Railroad is building the road from Stanger, on the north coast line of the Natal Government system, to the border line of Zululand at the Tugela, which it was expected would be finished at the end of 1898. With this piece of road the Natal-Zululand Railroad will own its own line from Verulam to the Tugela.

The railroads in Natal are built like the Cape Colony and other South African railroads, with a gage of 3 ft. 6 in. The original lines were laid with 40-lb. iron rails, but these have now disappeared, and 80-lb. and 61-lb. rails have been laid on the main line. The 80-lb. rail has lately been adopted as standard on the main line.

The gradients and curves on the lines in Natal are exceptionally severe. Of the present total mileage, more than 30 miles have grades of one in 30 and one in 35, and curves of from 300 to 350 ft. radius, while on over 60 miles more there are grades under one in 60 and curves of less than 450 ft. radius. The main trunk line reaches an altitude of 3,054 ft. above the level of the sea at a point 58 miles from Durban, and after falling 1,000 ft. in its further progress to Pietermaritzburg, again rises, 12 miles after leaving Pietermaritzburg, to a height of 3,700 ft. above the sea; at a point 130 miles from Durban an altitude of 5,152 ft. is reached, but on reaching Ladysmith, 191 miles from Port Natal, the altitude is 3,284 ft. The summit of the Biggarsberg chain of mountains is crossed at a point 233 miles from Port Natal, at a height of 4,600 ft., and when the border is reached, after crossing the western slope of the Drakensburg Mountains, the altitude of 5,400 ft. is traversed. The north and south coast lines, which follow generally the contour of the shore, are more level, and the scenery passed is exceedingly fine. The line into the Orange Free State ascends by steep gradients the whole of its course in Natal, and when it gains the border line of the Orange Free State on the summit of the more easterly point of the Drakensburg chain, it is 5,500 ft. above the sea.

In view of the great development now taking place in South Africa, surveys are constantly being made to get lines with easier grades, even at great cost, it being found that the difficulties and expenses connected with working over steep gradients far outweigh the interest on the additional capital expenditure involved in obtaining better lines. The only tunnels on the main line are the Langs Nek, 2,100 ft. long, and a short tunnel 70 ft. long.

In the coal regions the coal companies have built light branch lines to connect the mines with the railroad system. These aggregate about 15 miles.

All passenger cars of the more recent type have eight wheels, will accommodate 40 passengers and are lighted by electricity. The freight cars, some six and some eight-wheeled, are of 12, 20 and 22 tons capacity. All the passenger cars and the freight cars used on the main line are fitted with the latest type of English vacuum brakes. All bridge materials, rails and fastenings and rolling stock are bought through the Agent-General for Natal, in London.

We are indebted to Mr. David Hunter, General Manager of the Natal Government Railways, for the information relative to the railroads in Natal.

The Niles Tool Works.

More than a hundred members of the Western Railway Club accepted the invitation of the Niles Tool Works to visit its shops at Hamilton, O., on Jan. 18. These shops are full of work, and now employ 1,050 men, or more than twice the number em-

ployed two years ago, and extensive additions to the plant are under way. The iron foundry is said to be the largest in the country. The building is of steel construction, enclosed with brick, and was completed about a year ago. It is unusually well lighted, and some idea of its size can be gained from the fact that the moulding floor alone has an area of 100,000 sq. ft. The main bay is served by three 30-ton overhead electric cranes of 72 ft. span, and the smaller bays have three 15-ton cranes, in addition to which there are three other overhead and three gib cranes. The cupolas have a capacity for melting 75 tons of metal a day. Gun metal is used for gears re-

quiring greater strength than can be got in cast iron, in preference to cast steel.

The machine and erecting shop covers 15 acres, and is divided into two main bays, with a gallery on one side only, which is used for light lathe work. All the heavy tools are built in this shop, which is served by two 25-ton overhead cranes, while many of the large machines are served by small cranes. A new building, 157 ft. x 83 ft., has lately been completed, where 37-in., 51-in. and 60-in. boring mills are

The gun shop is also a recent addition to the works, and is equipped for building 12-in. mortars. These are now made at the rate of two a month.

The building of new shops and extensions has made necessary a better and more flexible distribution of power, and plans have been prepared for a power house which will shortly be built just west of the shops, and in which all the power will be concentrated. The engines will drive electric generators in the power house, and the machinery of all the shops will then be driven by electric motors. When this change is made, the plant will conform in all respects to the latest notions as to shop working.

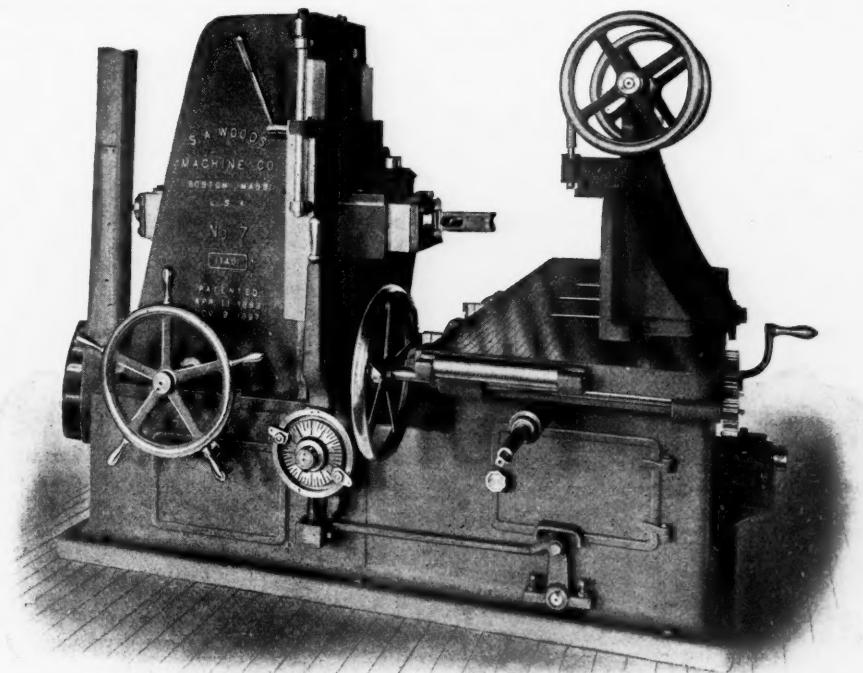
A practice of the Niles Tool Works which attracted the notice of many of the visitors is the employment of bell boys. Near each workman is a push button which is connected with an annunciator in the tool room, so that when a tool is needed the workman calls a bell boy, who finds out what is needed, and gets it, so that the workman is not obliged to leave his machine. The men are also expected to anticipate their wants as far as possible, so that unnecessary delays may not occur. The system has proved very satisfactory. The bell boys, after from three to five months' service, depending upon circumstances, are entered as apprentices, and are given a four years' course of training, their previous experience as bell boys making them familiar with the shops and shop methods, and with the kinds of tools needed for different classes of work. In fact, we are told it is surprising how much they learn while acting as bell boys. There are now 75 apprentices at the Niles Works.

Those who visited this plant saw some very large machinery in process of building, notable a lathe for turning up steel ingots, which had a bed 88 ft. long and was 40 ft. between centers. Two other heavy lathes for cutting up ingots were 25 ft. 6 in. long, and 10 ft. between centers, while some large milling machines were building for the Deutcher Niles Tool Works, at Berlin. This German plant will be practically a duplicate of the plant at Hamilton, O., and it is expected that it will be in working order by the middle of the present year.

Automatic Hollow Chisel Mortiser.

The Louisville & Nashville Railroad recently ordered from the S. A. Woods Machine Co., of Chicago, an automatic hollow chisel mortiser, known as Carse No. 7, an engraving of which is shown herewith.

The tool carriage is counterbalanced, travels to stops on the stop rod, and is moved vertically by the sprocket hand-wheel at the side of frame. The feed and spindle belts are long, the counter-shaft being above the machine and the feed has two changes of speed. The tool-plunger is driven by a rack and pinion always in line with the thrust, and the timber-fence is extra long and well stiffened by heavy ribs. There is a double stop arrangement in front of the timber-carriage, as well as one at the back of same, thus greatly facilitating the layout of work. The feed of tools is automatic, and regulated as to length of



Carse No. 7 Automatic Hollow Chisel Mortiser.

made in large numbers. These tools are said to be rapidly replacing lathes in railroad and general machine shops for such work as turning up eccentrics, eccentric straps, cylinder heads, etc. Another building, 162 ft. x 200 ft., is now completed, but not yet fitted up, which will be used exclusively for making small and medium size tools, such as lathes, shapers, radial drills, screw machines, special axle lathes and other railroad tools.

travel on the stop disc near to the operator, the motion being controlled by the vertical hand lever. The tool-carriage is counter-balanced, travels to stops on the stop-rod, and is moved vertically.

This machine is stiffer and more stable than former designs, as the heavy columns on which the tool-carriage travels gives the latter sufficient support at all points of the travel. Further information may be obtained by addressing the manufacturers.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN OPINIONS, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

The Rapid Transit Commissioners of the City of New York have sent a memorial to the Legislature of that State, preparing the way for a bill to be introduced, asking for further powers. The object of the Commissioners is to get power to offer to private bidders a franchise for building an underground railroad in New York. As the law now stands, the railroad must be built as the property of the city and the contractor who builds it must take a contract not only to build but to equip and operate it, for a term of years to be fixed by the Commission, not less than 35 years nor more than 50 years. After an examination of the efforts of the last eight or ten years, the Commissioners say that only three courses are suggested: (1) to wait until the borrowing capacity of the city is increased so that it can constitutionally borrow the necessary funds, or (2) to get authority to issue the bonds of the County of New York alone for building this railroad, or (3) to get authority to sell the franchise for building and working the railroad to a private company. It is the opinion of the Commissioners that under the increased assessed valuation of the city, bonds could be issued fast enough to carry on the building of the road with reasonable celerity; that is, bonds could be issued at the rate of perhaps \$10,000,000 a year. But the Commissioners consider that the uncertainties of this situation are great and that they ought to suggest other solutions. One of the plans offered is to make the new tunnel road the property of the Boroughs of Manhattan and the Bronx; that is, New York County alone, and to issue the bonds of that county to build it. The Comptroller, however, is of the opinion that the issue of such bonds is undesirable, and although he signs the memorial, he requires his opinion to be made known in the body of that document. There remains, therefore, the expedient of offering the franchise to private bidders. Under this it would be sold outright, and, if necessary, would be made perpetual. The Commissioners are careful to say that they are not at all convinced that they will be obliged to resort to this last expedient, but they wish the power to sell the franchise to be added to their other powers. While it is by no means certain that a satisfactory sale of such a franchise could be made, it would probably be a good thing all around if the Commissioners had such power as they ask for. Judiciously used, it might accelerate things amazingly. If the Manhattan system were electrified, probably no franchise for an underground railroad could be sold, but if the power to sell such a franchise existed, probably the Manhattan would be electrified.

Mr. Manning's Rail.

In 1894 (July 20) we were permitted to show a design of rail section then recently patented by the Chief Engineer of the Baltimore & Ohio Railroad. The patent involved no departure from the section

recommended by the American Society of Civil Engineers other than the addition of a small amount of metal on the gage side of the head. Indeed, the idea is applicable to any section, but Mr. Manning prefers to apply his improvement to that section, evidently considering it the best design in use. He now brings his improvement forward as of demonstrated utility and as ready for commercial use.

He has modified his original section somewhat by cutting away the lower corner. That is, on the gage side—the improved side—of the rail head the upper corner radius is $\frac{5}{16}$ in. Then there is a vertical tangent of about $\frac{1}{4}$ in., running into a curve of 1 in. radius, which is run into the line of the splicing surface under the head by a very short curve of $\frac{1}{16}$ in. radius. This is the improvement; the metal added is about $\frac{1}{4}$ in. on an 85-lb. rail. The result is an unsymmetrical section. All of these matters and more are explained in a pamphlet now published to call the attention of engineers and railroad managers to the "improved rail."

The first impression on looking at this section is not favorable. The engineer who has been interested in rail sections has come to see beauty in the symmetrical lines which he has learned to think are the correct lines. It is possible that some men even see beauty in the squat and hydrocephalous sections so common a few years ago. At least they are symmetrical with regard to one axis. This new lopsided rail therefore at once excites prejudice, and one must make some mental effort if he wishes to consider it fairly on its merits; but the engineer will quickly rid his mind of that first prejudice.

The claim for this new rail section is that it will add to the useful life of the rail at a very small cost by a better disposition of any given weight of metal. Putting the additional metal on the gage side will give longer wear before the flange of the wheel begins to strike the angle splice.

This is obvious enough, but the first thought that occurs to one is, why not put additional metal on the outside also and then turn the rail when it is flange-worn to the limit of proper use? In other words, if the limit of the life of a rail is in side wear, why not make the head wider and still make it symmetrical and turn the rail and use both sides?

Mr. Manning replies to this that by the time the rail is flange-worn so as to be unfit for further service in main line it is unfit to turn. It is worn on an inclined plane, and the bearing of the driver on the rail when turned would not be enough to get requisite adhesion. Furthermore, the considerably broader rail head would not work well with badly worn driving tires; that is, they would run on the outside of the head and so "have a greater tendency to make the metal flow and ruin the rail." He says that a rail, when the time has come to turn it, is no longer safe or serviceable for main track, and that many of the best operators do not turn the rail, but put it in less important track and buy new rail for the main line. These are the most important reasons, although he mentions other minor ones.

Evidently Mr. Manning has changed his mind with regard to turning rails since 1894. At that time one of his propositions was that he would provide a rail which, after giving the service usually rendered by the ordinary rail, might be reversed. He said that in laying rails as proposed, proper judgment would be used and they would be turned at the end of three or four years on ordinary curves, and perhaps at the end of two years on very heavy curves; and, further, that the exchange of rails from the low side to the high side of a curve is a matter of almost everyday occurrence.

In 1894 Mr. Manning thought that it would not be practicable to use the greater life given by increasing the metal on both sides of the rail for the reason that by the time the life of the rail which he proposes is done the rail would have deteriorated on the top to such a degree as to make it no longer fit for main line track.

As we understand his position, it is that the section should be so adjusted that the flange wear and the wear on the top of the rail will equalize and the rail will be worn out in both respects at the same time, and he believes that he has reached the best approximation to such an equalization in his unsymmetrical rail. This seems to be a most difficult thing to arrive at by reasoning or to arrive at by experiment either, except for certain limited classes of cases. Obviously, the relative wear on the top and the side of the rail will vary with the amount of curve in the track, with the average speed of trains and with the customary condition of rolling stock on any given line, and the disposition of metal which would be ideally best for one railroad or one division of one railroad might not be the best

for any other, and so in this particular the proposed unsymmetrical section might be a good one for one railroad and uneconomical for another railroad or division.

It is the practice of some railroads, and railroads of considerable curvature and of very heavy service, to reverse rails at some period in their life, and an engineer of maintenance of way, who has had experience with very heavy traffic, has told us within a few days that he has never heard of difficulty in starting or hauling trains on the reversed rail.

It appeared to us in 1894, and appears so still, that the flange wear of rails will be the limit of their life only in a very small percentage of the railroad line of the world. We cannot hazard even a guess as to what this percentage would be. It is a pretty common experience on railroads of heavy passenger traffic, where the standard of track is high with a view to smooth riding, that many rails fail first by wearing rough. The top of the rail gets out of surface from wear or distortion, and it has to be renewed because the track is sensibly rough to one riding over it. Again, the limit of the life of a rail in a great number of cases is reached at or near the end of the rail. This is a matter of common and melancholy experience. An obvious answer to this would be that if good life is left in the body of the rail it can be resawed, and of course that is often done, but the economy of the operation must depend upon the life still left in the rail. Mr. Manning would say that his unsymmetrical rail lends itself admirably to this sort of renewal. When the ends are bent or battered there will still be a good body of metal left to resist flange wear. Other engineers have found by experience that the top of the rail would have become so rough that it would not be worth while to resaw the rails, or, at any rate, to put them back in main line after sawing off the damaged ends.

All that we have said is no positive argument against the new section. We have suggested merely that there may not be such a demand for the section as the designer thinks there is. Still, why not try it? If it can do no harm and may do some good, obviously it is good sense to give it a trial.

A superficial consideration suggests some objections. The first cost per ton would be more. It is a new section and requires new rolls, and there is at once expense to some one. Evidently there will be a royalty charge also. Mr. Manning answers this by showing the saving in wear of metal.

It is apparent that the unsymmetrical rail will take special splices whenever it joins the ordinary rail, and that considerable complication will be introduced at frogs and switches. These objections, however, would disappear in the face of any important advantages that the section might develop.

Obviously, this new section is the result of experience on roads of much curvature, and on such roads the section may find profitable use, but we still doubt its applicability to railroads in general. On this, however, we do not venture to speak very positively, because long experience has shown that it is dangerous to dogmatize about rails and rail joints. The real value of the unsymmetrical section, if it has a real value, can be demonstrated in practice. Meantime, the inventor invites discussion of its probable merits.

Stable Rates.

The Trunk Lines are now maintaining freight rates everywhere, and have been doing so for four weeks. This is the universal report in the newspapers, no one denies it and no shipper is complaining that his neighbor is getting better rates than he can get. As in the early days of the Joint Traffic Association (the first few months of 1896), the presidents are giving evidence of the fact that they can stop secret rate cutting when they see fit. We do not mean by this that we suppose a way has been discovered by which the A. & B. road can compel the C. & D. to stick to its promises; there is no change in that respect. Agreements between corporations without the accompaniment of a money bond are as weak as ever, and, either with or without bonds, they are still illegal, as regards interstate commerce. But the presidents, each for himself, are maintaining the tariffs, and are charging the same rates to all shippers, for the reason, undoubtedly, that this course is believed to promise better ultimate results, whether one or all competitors do or do not follow an equally honorable course.

Of course each reader must draw his own conclusions as to the chief motive of a railroad pres-

ident for maintaining rates, when it may turn out any hour that the other fellows are getting much more than what has been regarded as their fair share of the whole competitive traffic, from, say, St. Louis, Kansas City or Chicago. The action of the Receivers of the Baltimore & Ohio in promising to make all their rates public is a challenge to all the other roads to do the same, and it is fair to assume that each president intends to make an open reduction very soon after he begins to suffer a serious loss of traffic as compared with his parallel competitors. How soon—whether ten hours, ten days or ten weeks—is the critical question, if we may judge by past experience. The grit to postpone a "retaliatory" reduction for a week may save thousands of dollars, by giving time for regular instead of irregular action.

But perhaps we cannot judge by past experience. The presidents seem to have conferred with each other on a basis more frank than has been known heretofore, and it may be that they have a better understanding than ever before. A thorough understanding is really the essential thing, as it is in the case of a strike of employees. When each and all interested parties thoroughly understand each other's intentions, all has been done that can be done by associated action. After that, if one line makes an open cut the only course for the others is to follow, or lose the business.

The Interstate Commerce Commissioners have taken occasion to state that they are not parties to the agreement of the presidents of the Trunk Lines to modify the differentials. The Commission, it is stated, "is not and could not be a party to any such agreement, and is not advised of any such agreement between the carriers. For a number of years these differentials have been the subject of much controversy, and it is probable that the question has again been considered by trunk line officials, but if there be such an understanding it is not one which the Commission is or could be a party to, nor has such a proposition been submitted to it in any way."

The first outward results of the abolition of secret rates are (1) the modification of the differentials, as reported in these columns last week; (2) a reduction of the rates on export grain below those on the same commodity for domestic delivery, and (3) a reduction on grain from Nebraska and Kansas as compared with that shipped from places east of the Missouri River. The rates on grain to New York (cents per 100 lbs.), which, it is understood, will be made on February 1, are as follows:

	Corn.	Other Grain.	
	Domes- tic Export.	tic.	Domes- tic Export.
From Chicago	16	17½	18½
From Miss. River	18½	20	21½
From Miss. River on ship- ments from west of Mo.			23
River	13½	20	21½

On export grain the rates to Philadelphia are to be 1 cent less than to New York; to Baltimore and Newport News, 1½ cents less than to New York. On domestic grain the Philadelphia differential is 1 cent, and to Baltimore and Newport News it is 1½. Live cattle, sheep and hogs are to be reduced 5 cents, to 25 cents, Chicago to New York, and provisions the same.

To New York these rates indicate a pronounced stiffening, as compared with the secret rates that have been reported by the shippers for the last six months, so that it is evident that the presidents have at last concluded that fighting for more business, when they cannot handle what is offered, is wasteful. To Baltimore (where Nebraska corn for export will still go at about 2½ mills per ton per mile), the advance is not so great, absolutely, but it is still large proportionally.

Whether or not the large contracts to New York at 10 cents and thereabouts, which have been reported during the last six months, have included much domestic grain, does not appear; but the differences between export and domestic now decided on, when combined with the reduction in the rate per mile on Kansas and Nebraska corn, as compared with that on corn raised east of the Missouri, are significant of the irresistible tendency of railroad competition and railroad economy to eliminate the middleman; to remove, as far as possible, all obstacles between the farmer and the consumer. Much has been said about the facilities accorded to the seller in the Kansas City, St. Louis and Chicago markets, and the advantages in price that he can secure by going there; and the Chicago and St. Louis grain brokers are now complaining more loudly than ever of the injustice of what the railroads have done; but the ineradicable fact remains that grain is bought by the

shipload in Kansas to go direct to European ports; and if the railroads to the Atlantic Coast do not bid low enough, those to Galveston will take it. The differences shown in the table printed above may be taken to indicate in some measure the force of Gulf route competition on European grain, and it does indeed represent a decided loss to the Trunk Lines. This competition may be of less force in years of light crops, but that does not afford much comfort to the Eastern lines now.

The conferences that have been held by the presidents seem to have had a tonic effect on passenger rates as well as freight. This is no more than should be expected, as Messrs. Cowen and Murray, in promising to obey the law, must have meant, of course, the whole of the law. But passenger-rate evils, though generally less important in immediate financial effects, are more insidious than freight-rate cutting, for the secret rebates are paid in dribs and drabs here and there, and are harder to trace. Moreover, a "commission" of a dollar does not seem so bad as a rebate voucher for \$100 or \$1,000. Some cutting of passenger rates has been rumored for several months, and within a few weeks the stronger lines have been accused of allowing theatrical parties excessive discounts on long journeys. A Chicago dispatch this week says that the agent of the Baltimore & Ohio has found evidence of illegal rates on a competing road and will report the case to his superiors to be laid before the Interstate Commerce Commission. What will come of this no one knows; but a few accusations may do some good, even if the legal proof does not prove sufficient. In the improved atmosphere now pervading New York-Chicago territory, the moral certainty that a road has been making secret cuts may have nearly as bad an effect on its reputation as an offense proved in court.

The passenger department of the Erie road has issued a significant circular to its connecting lines. It says:

"The Erie Railroad Company assumes full responsibility for maintenance of tariff rates on tickets of its issue from points in Trunk Line territory to destination; and in order that there may be no deviation from published fares connecting lines are respectfully requested to instruct their representatives that they must not, either by the payment of commission to the agent or allowance to the passenger, effect a reduction of rates on tickets of this company's issue. Your full co-operation in this matter will be appreciated."

"Full responsibility," must mean, of course, that tickets will not be allowed to get into passengers' hands at less than tariff rates; and this implies that the road will not pay commissions large enough to enable a ticket broker to divide his profit with the passenger. We do not know how many tickets of its own issue the Erie sells through "connecting lines;" we should suppose not many; but however this may be, the significant part of the circular is the last sentence, and that really includes the maintenance of rates by each road on its own tickets, as well as those of the Erie. It also is of such a nature that every ticket seller who sees the circular may take it to himself. And he may fairly assume, for all practical purposes, that it bears the signature not only of the Erie Railroad, but of all good citizens.

The annual report of the Interstate Commerce Commission, summarized in the Railroad Gazette last week, has been noticed and commented on by the daily newspapers quite generally, but the comments are not very fruitful in suggestions. The most salient characteristic of these editorials is their agreement on the fact that the Commission has failed to accomplish its chief purpose. The editors do not know what remedy to suggest, but they seem to be convinced, at last, that the Commission is not at present doing much useful work for the country. This, in itself, is a point worth noting, for heretofore there has been little evidence of intelligent, settled conviction on the part of the popular press, either one way or the other. Not all of the editors are, however, undecided. Some of them are convinced that the remedy now needed is the abandonment of the attempt to enforce by law both sharp competition and stable rates at the same time. Says the New York Mail and Express:

The Joint Traffic Association, while it lasted, afforded a considerable degree of protection against rate cutting. But now the last protective measure at the command of the companies is gone, and the rival lines have been engaged in a riot of reckless competition and rate slashing. The public is at last beginning to appreciate that the dissolution of the Association was a serious misfortune. That body was designed to prevent, and to a very great extent did prevent, discriminations against individuals or localities. It established certain restrictions upon competition among rival companies, and to that extent removed the temptation to rate cutting; and now its destruction has actually served to bring about the very evils which the public and the railroads have been trying to avoid. These evils, it is now admitted, cannot be reached by existing laws,

nor can they be corrected by the companies themselves. The consequence is that until some enabling legislation is provided the business interests of the country, including those of railroad shareholders, are subject to the embarrassment and loss which invariably attend reckless competition among the great trunk line carriers. At present, as Mr. Calhoun, a member of the Interstate Commission, observes, "no railroad manager can successfully operate his road and observe the law, or charge the same rate to all of his patrons, for his competitors are cutting the ground out from under his feet."

The Hankow-Canton Railroad.

We have received from our correspondent at Shanghai a complete copy of the terms of agreement entered into between the American syndicate which has undertaken the construction of the great Hankow-Canton Trunk Line and the Chinese Government. The following is a condensed report of the agreement:

His Majesty, the Emperor of China, has granted to Sheng Tajen the right to construct a railroad from the city of Hankow to Canton, and a Chinese company has been formed, called the "China Railway Company," of which His Excellency, Sheng Tajen, is to be Director-General. His Excellency has, however, deputed his right and powers in the above capacity to His Excellency, Wu Ting Fang, to enter into a contract with the American-China Development Company ["Brice Syndicate"—Editor], by which the latter-named company agrees inter alia to provide a sum of £4,000,000 for the construction and equipment of the road. In order that this loan may be secured, the Chinese Government has agreed that imperial gold bonds, similar in form to those secured on the imperial customs, shall be issued upon the security of a first mortgage. These bonds, which will be issued at 90 per cent. of their face value to the American-China Development Company, will be sealed by the Director-General of the Chinese Railway Company and countersigned by the Chinese Minister at Washington, and will carry interest at the rate of 5 per cent. per annum, payable half-yearly. The company shall have the right not only to build and equip the line to Canton, but from Canton to the sea, and to such other places as may be agreed upon with the Director-General, or, in other words, to construct branches. All materials are to be purchased in the open market at the lowest price. If, however, Chinese materials can be had as cheaply, they are to be preferred. All materials are to be admitted free of duty. To compensate the American-China Company for superintendence, it is to receive 5 per cent. of the cost of construction, except land and earthworks.

The sixth clause is a somewhat peculiar one. Providing, as it does, for the ordinary expenses in maintaining and conducting, it goes on to state that the American-China Company shall, after these have been paid, receive 20 per cent. of the net profits, "to be represented by and in form of debentures to an amount equal to one-fifth of the cost of the line." These are to be issued at the same time as the first mortgage bonds, the Chinese-American Railway to have the right to redeem these at any time at par, and if not redeemed shall expire after 43 years without payment.

The first mortgage bonds shall have a tenure of 50 years, and are to be redeemable any time up to 25 years from date of issue at 102½ for every \$100, but at any period after the redemption price shall be par value—\$100. When these bonds are paid off the Chinese Railway Company may, if so disposed, elect to take the entire management into its own hands, and may dispense with all or any foreign officials.—London Globe.

The Norfolk Western Street Railroad.

Between Medfield and Dedham, in Massachusetts, an electric road, known as the Norfolk Western Street Railroad, is being built, some of the engineering features of which are worthy of note. These two places are about 10 miles apart, and the conditions were such as to make it necessary to build the power station at Medfield Junction and transmit the current at a very high voltage to Westwood, a distance of about four miles, where it is transformed to direct current for the railroad and for street lighting. Besides using the current for lighting Westwood, provisions have been made for lighting Medfield, Norwood and Dedham, and this feature of the work will probably be of considerable importance.

The Medfield station, which will be finished by March 1, will have an output of 200 k. w., with room for enlargement to 400 k. w. The boilers are of the horizontal fire tube type, made by Edward Kendall & Sons, Cambridgeport, Mass. Mechanical draft has been adopted; an 80 in. Sturtevant full housing blower will be used at the station. The engines are two in number, one a Buckeye simple condensing, 165 h. p., the other a Ball compound condensing, 120 h. p. Provision has been made for another engine of the same size as the present Buckeye.

The generators are of General Electric make, three phase alternating, rated at 100 k. w., at 2,380 volts. The current is transmitted at this voltage to a substation at Westwood, the center of the line, and is there reduced by static rotary transformers to 550 volts. It is used at this voltage for the railroad and for the city lighting, for which 100 series incandescent street lights have already been contracted for.

The Jarvis Engineering Co., of Boston, is the contractor for the power house, and the Walworth Construction & Supply Co., of Boston, has the sub-contract for piping and steam apparatus, excepting boilers and engines. Deane jet condensers, Knowles pumps, American feed water heaters, Cochrane separators, and Walworth valves will be used throughout.

The President of the company is W. W. Mitchell, of

Medfield; J. J. Feely, 95 Milk street, Boston, is Treasurer and General Manager, and has charge of all work. The company was organized in 1898 with a capital stock of \$90,000.

The rails and rolling stock are all supplied, and the road will be complete, ready for operation, about March 1. H. Gore & Co., Boston, were the general contractors. Hodges & Harrington, of Boston, are the consulting engineers.

TECHNICAL.

Manufacturing and Business.

The Bucyrus Co., of South Milwaukee, reports that it is very busy and that the works have been running 24 hours a day for the past fourteen months. The company has orders on hand to keep it busy for some time. Among recent orders are one from the Chicago & Northwestern for 5 large steam shovels, one from the Northern Pacific for 4 shovels, and one from the Southern Indiana for 1 shovel.

F. A. Johann, formerly with More, Jones & Co., and late with Shickle, Harris & Howard Iron Co., has opened an office in the Laclede Building, St. Louis, to engage in the railroad supply business.

The contract for finishing section 18 of the Chicago Drainage Channel has been awarded to Gahan & Byrne for \$199,000. It provides for the rebuilding of Lock No. 1 at Joliet, the raising of three bridges and the deepening and widening of the channel near the mouth of the Des Plaines River.

E. L. Adams, of the Engineering Department of the International Brake Shoe Co., is now in England, and will assist that company's representatives, Messrs. Taite & Carleton, 63 Queen Victoria St., London, in the introduction of the "Diamond S" brake shoe.

The American Brake Shoe Co. reports that during December last the sales of "Diamond S" brake shoes were larger than in any previous month.

The Morse Twist Drill & Machine Co. announces its purchase of the machinery, stock, patents, good will, etc., of the T. & B. Tool Co., of Danbury, Conn., and the removal of the business to New Bedford, Mass. A full line of "increase twist drills" is carried in stock. To this will be added a complete assortment of "constant angle twist drills."

The Board of Railroad Commissioners of the State of New York will soon make tests of brakes for street surface railroad cars. Information regarding this can be had by addressing C. R. Barnes, Electrical Expert Railroad Commission, Albany, N. Y.

Pullman's Palace Car Co. has declared a quarterly dividend of \$1.50 a share, payable Feb. 15.

The Morgan Engineering Co., of Alliance, O., announces that hereafter its product will be sold direct and not through agencies. The agreement with the Niles Tool Works Co. has been terminated.

The Page Woven Wire Fence Co., of Adrian, Mich., reports that on Dec. 14, 1898, it shipped one train load of 30 cars, carrying over 400 miles of Page fence, which has been sold to Nebraska farmers, and on Dec. 30 another train load of 37 cars, carrying over 500 miles, which has been sold to Iowa and Missouri farmers. On Feb. 14, 1899, a train load containing over 500 miles of this fence will go to Nebraska; this also has been sold to the farmers there. On March 7 another train load, carrying over 500 miles, will be shipped to St. Paul.

The Acme Railway Equipment Co. has been incorporated in New Jersey, with a capital of \$100,000, to make railroad car equipment. The incorporators are: Thos. L. McKeen, Jos. R. Ellicott, Ernst P. Burritt.

Hancock type B locomotive inspirators, made by the Hancock Inspirator Co., of Boston, Mass., have been specified for two engines just ordered by the Boston, Revere Beach & Lynn from the Manchester Locomotive Works.

Iron and Steel.

At a meeting of the stockholders of the American Steel & Wire Co., held Jan. 24, the following Directors were elected: To serve three years—John W. Gates, Isaac S. Ellwood, Wm. Edensorn, Henry Seligman, John Lambert. To serve two years—Stewart H. Chisholm, Fred. P. Voorhees, Wm. P. Palmer, Philip W. Moen, Frederick Strauss. To serve one year—Geo. T. Oliver, Francis M. Drake, Chas. T. Boynton, James Hopkins and Chas. C. Howard.

It is stated that the Pennsylvania Steel Co. has received a cable order amounting to \$20,000 from France for street railroad supplies, consisting of curves, switches, crossings, etc.

It is stated that the Maryland Steel Co. has received an order for 1,000 tons of rails from the Caledonian Ry. Co. of Scotland.

J. C. Munn has been elected Secretary and General Manager of the Pittsburg Bridge Co., of Pittsburg, Pa., and L. A. Afleider, Jr., has been appointed Assistant Engineer.

At a recent meeting of the Board of Directors of the Aetna Standard Iron & Steel Co., Bridgeport, O., for the purpose of reorganization, the following officers were elected: John A. Topping, President; B.

M. Caldwell, Vice-President; Isaac M. Scott, Secretary; J. J. Holloway, Treasurer.

The Outlook in Marine Engineering.

Under this caption Commodore George W. Melville discusses some timely questions in the February issue of Cassier's Magazine. The article deals in part with high pressure steam for marine work, and some of the difficulties of working under these conditions are discussed. The possibility of some change in the valve gear, which would enable the clearances to be greatly reduced, is touched upon, and the writer states that if this could be accomplished successfully, there would certainly be a gain in economy. For fast-running engines, which must remain the rule in marine practice, nothing has yet been brought forward which is, on the whole, so satisfactory as the link motion, and this involves large clearances. Regarding superheating Commodore Melville is skeptical as to its extended use in marine work, and believes that until superheating is shown by shore experiments to be an unqualified success it will probably not be tried again in marine work. The conclusions of the writer are as follows: "We may thus anticipate the adoption of reheaters in the near future, and a gradual increase of pressures with the use of four-stage engines. As experience is gained, moderate superheating, enough at least to give dry steam in the first cylinder, may be adopted."

Surface-Contact Electric Road Abandoned.

At a meeting in Washington, D. C., on Friday of last week, Mr. O. T. Crosby, President of the Capitol Railway Co., announced that his company, after many months' trial, had decided to abandon the "Brown system" of electric traction, and that the entire line of the Anacostia road would be equipped similar to the Buda-Pesth electrical roads.

The East Boston Tunnel.

A resolution was introduced in the Massachusetts Senate last Friday calling for the initiation of work on the proposed tunnel between Scollay Square, Boston, and Maverick Square, East Boston, under the mouth of the Charles River.

The construction of the tunnel was authorized in the Subway act of 1894, and work was begun on the plans last July. In December the Supreme Court of the State granted an injunction restraining the Transit Commissioners from any further action, pending a ruling as to the legality of that portion of the act relating to the tunnel.

The Legislature is believed to be disposed to favor the tunnel, and its action in referring the resolution to the standing Committee on Metropolitan Affairs may result from a desire to influence favorably the decision of the Supreme Court.

Brake Gear.

The Master Car Builders' Association Committee on Air-Brake Appliances has sent out a circular as follows:

Your Committee on Air-Brake Appliances to propose complete standards, including piping, etc., desires your co-operation in assembling all information of value concerning the question of air-brake appliances on freight car equipment, and would, therefore, be under obligations to you if you will reply on as early a date as practicable to the following inquiries:

1. Do you consider it advisable to locate cylinders and triple valves on all cars where practicable, so they can be readily reached with a reasonable degree of safety by repairmen for cleaning and repairing? Please indicate preference of location on different classes of cars.

2. Do you think it advisable to dispense with all elbows and screw joints in air pipes (including retaining valve pipes), when possible, substituting therefor bends of large radius? If so, please designate in your replies places where you think changes could be made. Also please say if you have any special instruction governing the care of retaining valves.

3. Many roads have discarded the "Dummy" coupler. Your views on this subject are also desired.

4. As we believe exact conformity to the Westinghouse recommended air-brake practice, as shown by their charts, is an unusual thing rather than common practice, please express your views as to the advisability of adopting this recommended practice, with such modifications as a committee of this association, working in cooperation with the Westinghouse Company's representative, might agree upon.

Please forward blue prints showing arrangement of air brake and piping on the equipment you represent, and refer to any special features you have developed in the plans submitted.

Please send replies and blue prints to A. L. Humphrey, Superintendent Motive Power, Colorado Midland Ry., Colorado City, Col., on or before Feb. 25, 1899.

Electricity on the Great Northern.

The newspapers say that the Great Northern is considering the advisability of working the Cascade tunnel by electricity. Mr. Miller, Chief Engineer of the road, is reported as saying that if this is done the distance worked by electricity will be 65 miles, between Leavenworth and Skykomish. There is ample water power, and the grades are not severe. The tunnel will be finished within two years and will be about 2½ miles long.

THE SCRAP HEAP.

Notes.

The anti-scalper bill was taken up in the Senate at Washington on Saturday last, but no decisive action was taken. It was placed on the calendar, so that it is likely to come up again soon. There was a test vote, showing that a majority of those present, 55 in all, were in favor of the bill.

The suit of the Attorney-General of Texas against the Missouri, Kansas & Texas, to forfeit the company's charter, appears to have been begun largely for its effect on public opinion, and as a threat, to hold over this and other roads if any advance should be made in freight rates. The principal charge specified in the Attorney-General's bill was that the road had deliberately impoverished its Texas lines for the benefit of lines outside the state. The hearing on the suit has been postponed several weeks.

Contracts are being made at Duluth for the transportation of iron ore to Lake Erie ports next season. A press dispatch of Jan. 19 says that contracts aggregating about 6,000,000 tons have already been made at 60 cents a ton. At this rate vessels carrying less than 3,500 tons each would probably be unable to pay expenses, and all the smaller vessels will therefore be shut out of the business. It is estimated that the owners of the large vessels are satisfied to make a net profit of eight per cent, and that, therefore, the price of iron can never again be raised by fluctuations in the cost of lake transportation. No longer ago than 1894 activity like that which now prevails would have forced a large advance in lake rates and would thus have greatly checked the export of iron from this country by increasing the cost of the raw material.

Locomotives for Japan.

Messrs. Neilson, Reid & Co., of the Glasgow Locomotive Works, have an order for 20 passenger engines for the Imperial Railroads of Japan.

Railroad Lectures.

Mr. W. M. Acworth will give a course of lectures on Railway Economics during the Lent term of the London School of Economics. There will be six of these lectures, beginning Jan. 26 and continued on Thursdays.

Motor Car Engine.

A syndicate has been formed in Glasgow, with a capital of \$250,000, to make and exploit a motor car engine. An effort has been made to have this engine introduced for working the tramway cars of the Glasgow Corporation. The syndicate includes the names of Sir William Arrol and several members of the Coats family, great thread makers.

Street Railroads in Finland.

At present there is but one street railroad in operation in Finland. It is the Sparvags-ock Omnibus-aktiebolaget i Helsingfors of Helsingfors, a horse line of 5.3 miles. The company is soon to introduce electricity and extend the road. Two or three other street railroads were laid a few years ago, but failed to make expenses.

State Ownership of Railroads in Japan.

The subject of Government ownership of the private railroads in Japan is now under discussion. It is believed that a large percentage of the private railroad companies are in favor of the scheme, but public opinion seems to be against it, as it is believed that should the government undertake to manage the private systems a number of improvements now being undertaken would be dropped.

Change of Gage on Gravity Railroad.

The gravity coal railroad of the Delaware & Hudson Canal Co., between Honesdale and Carbondale, Pa., is now standard gage, the track having been changed from 4 ft. 3 in. to 4 ft. 8½ in. on Sunday last. The bridges have been strengthened to carry large standard gage cars, and a part of the passenger cars used on the Gravity track have been changed to standard gage.

Public Works in Egypt.

In 1898 the commissioners of the debt in Egypt advanced or agreed to advance, about £2,000,000, mainly for the construction of railroads and public buildings. They have further agreed to advance £564,000 in 1899 for useful public works. This is only a part of a programme drawn up by the Government for extraordinary expenditure on necessary public works, to be spread over five years and amounting in all to £2,800,000.

A Learned Profession.

On some new railroad work in Germany it has come to light that a considerable number of the hands had been educated in the universities. There were so many of them in one gang that it went under the name of "the Philosophers' Shift." In another gang not far from these a Protestant clergyman who visited the men in their barracks found two fellow clergymen among them, and a Catholic priest found a workman who had studied theology with him.

Electric Railroads in Russia.

Consul Thomas Smith writes from Moscow, under date of Dec. 13, that the Ministry of the Interior is at present considering the question of building a network of electric railroads in Riga, Russia. The town corporation has already taken this matter in hand, and the Ministry has expressed its willingness to support the town by allowing a loan for the above purpose on profitable conditions. The cost of building the electric railroads in Riga has been estimated at \$800,000.

There Are Others.

Marion, Ind., is one of the best paying local stations on the Toledo, St. Louis & Kansas City, and has the poorest depot. The room used for a ticket office, telegraph office, waiting room and baggage room is, by actual measurement, twenty feet square, and on Saturday there were fifteen large commercial trunks, a number of valises, five ladies and eleven gentlemen crowded into that room awaiting the arrival of the morning train westbound. The citizens are urging the receiver to give them better accommodations—Exchange.

Gas Engine Plant.

A very large gas engine plant is to be installed at the Lot's Road pumping station of the London County Council. It is to be supplied by Messrs. Crossley

Bros., of Manchester, and will consist of eight double cylinder horizontal gas engines, four of 260 i. h. p. each and four of 210 i. h. p. each. There will also be four small engines of five i. h. p. each, combined with air compressors and hydraulic pumps. Engineering, from which we get this information, says that this will be probably the largest gas engine plant in existence.

State Street Subway, Chicago.

The new State street subway between Sixty-third and Sixty-fifth streets, was opened Jan. 19, and electric cars from the south now pass through the tunnel and transfer passengers direct to the cable line. The subway was built in connection with the track elevation work, and is under the Lake Shore & Michigan Southern and the Pittsburgh, Fort Wayne & Chicago roads, which have about 80 tracks at that point. The tunnel is about 1,400 ft. long, and is lighted by incandescent lights which will be necessary except on the brightest days. Heretofore passengers from points south have had to walk across the tracks in order to transfer to the State street cable line.

Verdict in Gas Tank Case.

On Tuesday of this week Coroner Zucca and a jury concluded the inquest in the cases of the eight men who were killed by the gas tank failure on Dec. 13 at Twenty-first St., New York City. In the investigation no very important testimony was apparently given. Mr. Charles L. Rowland, Mechanical Engineer of the Logan Iron Works Co., which supplied the iron for the tank, gave it as his opinion that the tank did not collapse from water pressure and that there was no gas in the holder at the time of the accident, but would not say that it was wrecked by an explosion. The jury in its verdict stated that "the construction and material were in accordance with the plans and specifications and that the workmanship thereon was of good character." They suggested that all such work in future be subject to proper municipal supervision and control.

Chicago in the River and Harbor Bill.

The River and Harbor bill prepared by the House Committee carries an appropriation of \$75,000 cash for the Chicago Harbor and authorizes contracts for \$377,826 to complete the harbor. Calumet harbor is given \$150,000 cash and \$859,930 to complete the harbor and breakwater, beside \$60,000 for the Calumet River. The bill also provides for a survey and estimate of the cost of deepening the Chicago River to a 21-ft. channel, exclusive of lowering the tunnels and removing the bridges. The bill makes a cash appropriation of \$100,000 for the Illinois River and provides for a survey and estimate of cost of work on the upper Illinois and lower Des Plaines rivers, with a view to securing a new channel from the Illinois River to Lake Michigan at or near Chicago. This survey is to be made by a board of engineers recommended by Major Marshall, Corps of Engineers, U. S. A.

Fast Runs.

On Wednesday night, Jan. 11, the westbound fast mail train of the Chicago, Burlington & Quincy was late in leaving Chicago and made the run to Burlington, 206 miles, in 208 minutes, including stops which aggregated 10 minutes. The time from Chicago (four miles from Union Station) to Aurora, 33 miles, was 32 mins.; Aurora to Mendota, 46 miles, 40 mins.; Mendota to Galesburg, 80 miles, 75 mins.; Galesburg to Burlington, 43 miles, 42 mins.

The first trip of the new fast train of the Chicago, Rock Island & Pacific from Chicago to Omaha was made in 12 hours (distance, 503.4 miles); net running time, 10 hours 27 minutes. This train took mail from the Lake Shore train at Englewood at 8:18 p. m., thus saving about an hour and a half, as compared with a transfer at the Chicago terminals. This train carries passengers, having three cars besides the mail cars.

Electric Work in Lourenco Marquez.

In his annual report Consul Hollis, of Lourenco Marquez, states that already \$250,000 has been spent by the Companie Generale d'Electricite in electrical interests at that place. The government some time ago gave a Belgian syndicate a concession of 50 years to build an electric street railroad at Lourenco Marquez, and plans were approved by the municipal chamber. By the terms of the concession work on the line must be begun by July 5 of this year and must be completed and opened for traffic nine months after that time. The plans provide for about four miles of overhead wire street railroad. In the same report it is stated that the town council of Durban, Natal, is about to appoint two engineers to investigate the street railroads of America and Europe, in order that they may intelligently decide on the best system for that city.

British Shipbuilding in 1898.

In the shipbuilding trade the year now ending has been one of unparalleled activity. The total production of the year is estimated by the Newcastle Daily Chronicle at 1,610,000 tons, which compares with the output of immediately preceding years thus:

Year.	Tons.	Year.	Tons.
1898	1,610,000	1895	1,074,900
1897	1,095,900	1894	1,080,400
1896	1,316,900	1893	878,000

The increase of this year as compared with last is no less than 514,100 tons, or 47 per cent., but it has to be borne in mind that the engineers' strike not only restricted the output in 1897, but also projected into the present year arrears of work, to overtake which great efforts had to be made. Of the year's output 466,832 tons are credited to the Clyde District, 307,300 tons to the Tyne, 262,800 tons to the Wear, 279,000 tons to all the other Northeastern ports, and 121,400 tons to Belfast.—The Economist.

Moroccoline.

The makers of this substitute for leather have so named it, because its surface appearance and wearing qualities are quite like morocco leather. It consists of an extra-heavy surface coating of a tough, elastic composition laid on a single thickness of either drill or duck. Its peculiarity, its difference from other imitations of leather, is, that to produce a heavy car-seat covering, one thickness of heavy duck can be used instead of two pieces of cloth pasted together. Built-up product of more than one thickness has been found to develop blistering. It is embossed by the same electro-plate process that is used for finishing leather, so that any of the commercial leather grain surfaces can be reproduced in

moroccoline in all colors, and be made so like the real leather in color, feeling, durability and general appearance as to make the difference difficult to detect. It is sold at about one-third the price of hand-buffed upholstery leather, and is made by the Boston Artificial Leather Company, of Boston, Mass.

To Change Street Railroads in Chicago.

At a meeting of the City Council Jan. 16, Mr. Chas. T. Yerkes made application for permission to substitute the overhead trolley for the cable and horses as a motive power on the entire north and west side street railroad systems. The ordinance was referred without debate to the Joint Committee on Streets and Alleys. The ordinance would affect the lines on the north side, which control almost 100 miles of road, about 17 miles of which are now operated by cable, and including five trolley lines which operate chiefly in the northern section of the north side and extend to various northern suburbs. The lines on the west side control about 200 miles of cable and overhead trolley lines, the latter being in use on four suburban lines. It is said that Mayor Harrison will not sign an ordinance permitting overhead trolley lines in the business district, but that a proposition to change the present cable to underground electric lines would be acceptable to the present city administration.

Bicycles on English Railroads.

The number of bicycles carried out of London on passenger trains by the principal railroads for the three months ending Sept. 30 last was 211,232, and during the holiday week ending Aug. 1 the number on all the roads was very much larger than the average which would be indicated by this total. The statistics giving the number for each of the three months from the 15 principal stations have been gathered by the Railway Engineer, there having been much complaint concerning the unpunctuality of trains and a good deal of discussion as to whether or not the delays caused by loading bicycles were chargeable with the irregularities of the trains. The station from which the largest number was sent during the period mentioned was that of the London & South Western (Waterloo), 33,751. The next four were: Great Eastern, 32,554; Great Western, 24,230; London & North Western, 20,000 (estimated); Great Northern, 19,864. No facts are given as to the causes of the delays which were complained of, but the Railway Engineer feels sure that the bicycle is the only discoverable cause.

New Fitchburg Grain Elevator at Boston.

The Fitchburg Railroad is building a fireproof grain elevator at Charlestown (Boston), to take the place of the building which was destroyed by fire a few months ago. The new building is 84 ft. wide, 260 ft. long and 160 ft. high, and will hold 1,000,000 bushels of grain. The frame is of steel, and all exposed parts are covered with cement, brick or fireproof metal. The only wood used in the building is in the bins; but these are set in fireproof concrete, and protected by 6-in. tiling. There are 126 bins, each 70 ft. high, 13 ft. sq., with a capacity of 9,000 bu. The floors are of double tiling, covered with 1 in. of cement. The walls also are of tiling, 12 in. thick. The outside of the building will be glazed tiles.

The tracks in the building accommodate 18 cars. The engine for elevating the grain and supplying all other needed power, is of 1,000 h. p., cross compound. The nine belts for conveying grain to vessels are 36 in. wide, and will each be run by an electric motor. These belts will deliver 12,000 bushels an hour each. The elevators for taking grain from the cars will be run directly by the steam engine, and will unload 240 cars in 10 hours. The scales, which are on the third floor, will each weigh 1,400 bushels of grain at one time. The elevator and galleries have pipes, exhausted by powerful fans, which will suck all dust from every part of the building and convey it to the boiler house, where it will be fed to the furnaces.

The elevator is being built by James L. Record, of Minneapolis.

Chicago Board of Trade.

The Chicago Board of Trade, which now has 1,833 members, held its annual meeting on Monday, Jan. 16, and considered the reports of its President and Board of Directors. These reports show the receipts of grain and of flour reckoned at its equivalent in grain, at Chicago in 1898, to have been 320,436,357 bush., an increase of 23,669,241 bush. over 1897. The shipments of the same in 1898 were 287,408,904 bush., an increase of 34,779,502 bush. over 1897. The shipments of meat of all kinds during 1898 amounted to 2,123,623,730 lbs., an increase of 131,185,489 lbs. over 1897. The number of cattle, hogs and sheep received in 1898 was 14,887,450 head, an increase of 362,162 over 1897.

Resolutions were adopted declaring that since the government assumed jurisdiction over the Chicago River in 1890 the harbor and waterway have been practically neglected, while millions have been appropriated for the improvement of rivers and harbors elsewhere in the United States. The largest vessels now used on the lakes demand at Chicago a channel 225 ft. wide and 21 ft. deep, with non-obstructive bridges. The largest vessels now admitted to the Chicago River are about 325 ft. long, 45 ft. wide and 16 ft. draft. To accommodate boats up to 500 ft. long, 20 ft. draft and 50 ft. beam, changes in most of the bridges, the lowering of the street railroad tunnels and rebuilding of many docks will be necessary.

Chicago River Improvement Association.

A meeting of the Chicago River Improvement Association was held Jan. 19, which was attended by many well known business men, interested in the work of improving the harbor, and also by prominent officials of several railroads, including Messrs. W. C. Brown, General Manager C. B. & Q.; A. J. Earling, Vice-President C. M. & St. P.; F. A. Delano, Superintendent of Freight Terminals C. B. & Q., and others. The resolutions, which were unanimously adopted, recite that Congress has promised to dredge and straighten the river after the tunnels are lowered and the center-pier bridges removed; that the Government has decided that the changing of tunnels and bridges is the work of the city; that the city has power to compel the street railroads to lower the tunnels, but has not power to raise money to do this work itself; and that as the street railroads derive the entire benefits of the tunnels they should pay the cost of lowering them to permit a depth of 26 ft. in the river; and the Mayor and Council are urged to take immediate action toward the removal of the obstructions. Also, that in any extensions to

franchises to the street railroads provisions compelling the roads to lower the tunnels should be included. Another resolution was also passed asking the Mayor to appoint a committee to consider the matter of better facilities for the navigation of the river and looking toward the better co-operation of the Government, the Drainage Trustees and the City.

Beautiful Space Writing.

The Railroad Gazette record of train accidents for January will not be so long as it might have been, for two engines which tried to touch noses out in Iowa failed to carry out their evil purposes. For the particulars we are indebted to an eloquent contemporary. It was on the morning of Jan. 5, near Sioux City, the trains being a passenger and a freight of the Chicago, St. Paul, Minneapolis & Omaha. A special freight train bound south ought to have waited at Leeds, a few miles north of Sioux City, for the northbound passenger train, which starts out at 7:15, but the conductor and the engineman of the freight train had forgotten about the passenger and "they were steaming ahead at a furious rate, without a thought of danger." The conductor and engineman of the passenger train, having the right of the road, were likewise steaming ahead, with a similar absence of thought; but danger was right there, and ever since that hour the conductors and enginemans have very frequently shuddered. "If the morning had been foggy, instead of bright and clear," says the Sioux City Times, "or if either of the enginemans had not been on the alert as they were, it seems certain the monster locomotive, with its load of fat stock hurrying toward the market, and the panther-like passenger engine, long and slim, with its burden of humanity, would have rushed together in deadly embrace. . . . The two engines caught sight of each other at the same instant. Then there was quick work in the cabs, and in thirty seconds the two trains, with their engines puffing and quivering, had stopped on the curve near the residence of Alderman Tredway, with a distance of about two blocks between them. The engineman of the passenger train, pale with excitement, leaned out of his window and asked John B. Cosgrove, section foreman for the Illinois Central, 'What in Sam Hill is that up the track?' 'Second section of 15,' answered the track boss, who had seen the danger the two trains were in and who is said to have signaled the passenger train. He also was doing some nervous shaking. 'Toot, toot, toot-t!' shrieked the passenger engine. 'Toot, toot, toot-t!' sullenly responded the big mogul, which began to move its train backwards."

To which we might add that a certain nameless place might have frozen over.

LOCOMOTIVE BUILDING.

The Chicago Great Western is building six tenders in its own shops.

It is reported that the Pacific Coast has asked bids on one freight engine.

It is rumored that the Missouri Pacific is in the market for a number of locomotives.

It is reported that the Atchison, Topeka & Santa Fe will buy 10 more passenger locomotives.

The Long Island has ordered one heavy 6-wheel switcher from the Baldwin Locomotive Works.

The Monterey & Mexican Gulf is having two locomotives built by the Rogers Locomotive Works.

It is reported that the Union Pacific will this week order the 45 engines noted in our issue of Dec. 2.

The Boston, Revere Beach & Lynn has ordered two engines from the Manchester Locomotive Works.

We are reliably informed that the Oregon Short Line is considering buying 30 freight locomotives.

The Chicago & West Michigan has ordered two freight locomotives from the Manchester Locomotive Works.

The Denver & Rio Grande is about to order in New York the 10 freight locomotives noted in our issue of Jan. 13.

The Louisville, Evansville & St. Louis has ordered four 19x24 switching engines from the Rogers Locomotive Co.

The Atlanta, Valdosta & Western has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

It is reported that the Colorado & Southern will buy from 8 to 10 locomotives, but we have not been able to confirm this.

The Indiana, Illinois & Iowa is preparing specifications for locomotives, but has not determined when or how many it will order.

The Chicago, Burlington & Quincy is about receiving bids for from 10 to 20 modified Class H mogul engines, with 19x26 in. cylinders, noted last week.

The Delaware & Hudson Canal Co. has ordered 25 consolidation locomotives, 15 from the Schenectady Locomotive Works and 10 from the Dickson Locomotive Works.

In our issue of Jan. 20 we noted an order placed with the Baldwin Locomotive Works by the Nashville, Chattanooga & St. Louis for six engines. This should be seven engines.

In our issue of Dec. 9 we stated that the Pittsburgh & Lake Erie had prepared plans for five consolidation locomotives. These are now being built by the Pittsburgh Locomotive Works.

The Mexican Central has ordered four locomotives from the Baldwin Locomotive Works and four from the Rogers Locomotive Co. They will have 160,000 lbs. on the drivers, 55 in. wheels, 21x26 in. cylinders and 74 in. boilers.

Last week we noted that the Illinois Central was reported as considering a large order for locomotives. We are now informed officially that this road will probably be in the market next spring for engines for use next fall, but that no definite conclusion has been reached.

In our last issue we referred to an order of the Chicago, Indianapolis & Louisville for three 12-wheel engines given to the Brooks Locomotive Works. They will weigh 176,000 lbs., with 144,000 lbs. on the drivers, and have 21 in. x 26 in. cylinders, 54-in. dri-

vers, improved Belpaire boilers, with a working steam pressure of 200 lbs.; fireboxes 120 in. long and 41 $\frac{1}{4}$ in. wide, with a tank capacity for 4,500 gals. of water. The special equipments will consist of New York air brakes, Gollmar bell ringers, Monarch brake beams, Ross-Meehan brake shoes, U. S. piston-rod packings, Brooks Locomotive Works valve-rod packings, Leach sanding devices, French springs and Brooks Locomotive Works improved piston valves.

The five 10-wheel engines for the Long Island Railroad, building by the Brooks Locomotive Works, will have 21 \times 26-in. cylinders, 60 $\frac{1}{2}$ -in. driving wheels, Wootton boilers, with 180 lbs. working steam pressure; fireboxes 120 in. long and 84 in. wide, and a tank capacity for 4,000 gals. of water and seven tons of coal. The engines will weigh 149,000 lbs., with 116,000 lbs. on the drivers, and will be equipped with Westinghouse brakes, Coffin process toughened steel axles, Gollmar bell ringers, Monarch brake beams, Lappin brake shoes, Standard couplers, L. I. RR. standard headlights, Sellers' injectors, U. S. Metallic piston and valve rod packings, Prince patent safety valves, Leach sanding devices, Detroit lubricators, French springs and Latrobe tires.

The two special consolidation freight engines building by the Brooks Locomotive Works for the St. Joseph & Grand Island, and referred to last week, will have 18 in. x 30 in. cylinders, 54-in. driving wheels, extended wagon-top type boilers, with a working steam pressure of 200 lbs.; fireboxes 114 in. long and 42 in. wide, and will weigh 154,000 lbs., with 136,600 lbs. on the driving wheels. The tender capacity will be 4,500 gals. of water and seven tons of coal. The locomotives will have Westinghouse brakes, hammered iron axles, Gollmar bell ringers, Kewanee brake beams, Ross-Meehan brake shoes, Janney couplers, Monitor injectors, Sullivan piston-rod packings, Brooks Locomotive Works valve-rod packings, Houston sanding devices, Nathan lubricators, French springs, Latrobe tires, cast-steel wheel centers and Brooks Locomotive Works improved piston valves.

We are officially informed that the Chicago & Northwestern has placed the following orders with the Schenectady Locomotive Works: Six 8-wheel engines for heavy passenger service, such as the Chicago-St. Paul limited and trains Nos. 1 and 2, which carry from 8 to 11 cars each. These engines will have cylinders 19 $\frac{1}{2}$ in. x 26 in.; wheel centers of drivers 68 in. in. diam.; weight on drivers, 87,000 lbs.; steam pressure, 190 lbs.; radial stay boilers, 65 in. in. diam. at the first ring and 75 in. at back ring; 350 tubes; firebox, on top of frames, 102 in. long; heating surface, 2,450 sq. ft. Ten class M switching engines, with cylinders 18 in. x 24 in.; steam pressure, 175 lbs.; weight on drivers, 110,000 lbs. These engines are duplicates of those previously ordered, of which about 30 are now in service. The order also includes a number of class R 10-wheel locomotives exactly like the five recently ordered from the Baldwin Locomotive Works, as noted in our issue of Jan. 13.

CAR BUILDING.

It is reported that the Boston & Albany will buy some passenger coaches.

We are reliably informed that the Missouri Pacific will order 1,000 stock cars.

The Boston & Albany has placed an order with the Union Car Co. for 200 box cars.

The Baltimore & Ohio has ordered 5,000 steel cars from the Schoen Pressed Steel Co.

We are reliably informed that the Great Northern is figuring on 50 passenger coaches.

The Denver & Rio Grande has ordered three dining cars from the Ohio Falls Car Mfg. Co.

The Pullman Palace Car Co. is building 20 passenger coaches for the Northern Pacific.

We are officially informed that the Louisville, Evansville & St. Louis will buy 30 ballast cars.

The South Baltimore Car Works are building 20 freight cars for the West Virginia & Pittsburgh.

The Chesapeake & Ohio has placed an order with Pullman's Palace Car Co. for 800 40-ton gondola coal cars.

It is reported that the Central of New Jersey has ordered 500 more cars from the Michigan-Peninsular Car Co.

The U. S. Government has placed an order with the Ryan & McDonald Mfg. Co. for 20 cars, for use in Cuba.

The Barney & Smith Car Co. is building four passenger cars for the Burlington, Cedar Rapids & Northern.

We are reliably informed that the Cleveland Terminal & Valley order for 300 coal cars will be let as we go to press.

We are reliably informed that the Oregon Short Line has ordered 300 steel cars from the Schoen Pressed Steel Co.

Pullman's Palace Car Co. has received an order from the Cleveland, Cincinnati, Chicago & St. Louis for 2,000 box cars.

Last week we noted a report that the Lehigh Valley will order 500 coal cars. It is now rumored that these are about to be let.

It is stated that the Texas & Pacific has ordered 500 freight cars, 400 from the Ohio Falls Car Mfg. Co. and 100 from the Lenoir Car Co.

The Denver & Rio Grande has placed an order with the Ohio Falls Car Mfg. Co. for the 500 box cars, 250 stock cars and 250 coal cars mentioned in our issue of Jan. 13.

It has been reported that the Washington Coal & Coke Co. will shortly order some new gondola cars. We are advised by the company that this report is not correct.

In our issue of Jan. 13 we noted that the Brainerd & Northern Minnesota had placed an order with the Mount Vernon Car Mfg. Co. for 60 flat cars. This order has increased to 120.

The Mexican Central has placed orders for 30-ton cars, as follows: Mt. Vernon Car Mfg. Co., 100 box and 100 stock cars; Michigan-Peninsular Car Co., 250 box, 50 stock and 50 coal cars.

The 30-ton box cars ordered by the Chicago, Burlington & Quincy from the Chicago Car & Equipment Co. will have steel axles, Westinghouse air brakes, Chicago couplers and Neponset roofs.

We are officially informed that the Indiana, Illinois & Iowa is preparing specifications for box and coal cars, but when and to what extent the road will be in the market has not been decided.

It has been rumored that the Cleveland, Canton & Southern would soon be in the market for new freight cars, but we are informed by the Receiver and General Manager that this report is without foundation.

We are officially informed that the Illinois Central will probably be in the market next spring for freight cars for use next fall, but that no definite conclusion has been reached as yet regarding the character of such equipment.

L. M. Fouts, President and General Manager, Weatherford, Mineral Wells & Northwestern, Weatherford, Tex., writes as follows: "Parties operating manufacturing plants in the state (Texas) have authorized me to purchase for them 50 box cars, to be delivered not later than Sept. 1. The cars are to be first-class in every respect, of 20 tons capacity, and equipped with air brakes and automatic couplers. Complete specifications must accompany bids. I wish to close the contract as early as possible."

The 50 refrigerator cars ordered by the American Refrigerator Transit Co. from the Missouri Car & Foundry Co., as noted in our issue of Jan. 13, are for April delivery. They will be 38 ft. 11 in. long, 8 ft. 10 in. wide and 12 ft. 4 in. high, of 50,000 lbs. capacity, and will weigh 38,000 lbs. Westinghouse air brakes, interchangeable brake beams, Janney couplers, Gould draft rigging, McCord journal boxes and journal-box lids, Drake & Weirs' roofs, Pickering springs, wrought iron axles, steel bolsters, cast-iron brake shoes, solid lead-lined brasses, cast-iron wheels, and American Refrigerator Transit Co.'s standard trucks, doors and door fastenings will be used.

In our issue of Jan. 13 we referred to orders placed by the Cincinnati, New Orleans & Texas Pacific. These call for 100 furniture and 300 hopper-bottom gondola cars, to be built by the Ohio Falls Car Mfg. Co., and 100 flat cars, by the Lenoir Car Co. All the cars will be of 60,000 lbs. capacity; the furniture cars will measure 42 ft. long, 8 ft. 6 in. wide and 8 ft. 10 in. high inside; the gondola cars, 40 ft. long over end sills and 8 ft. 11 in. wide over side sills, and the flat cars 40 ft. long, 9 ft. 2 in. wide and 4 ft. 3 $\frac{1}{2}$ in. high. The specifications call for Buckeye couplers, solid brake beams, Christie brake shoes, Westinghouse brakes, Ajax brasses, Lone Star couplers, C. N. O. & T. P. RR. standard draft rigging, M. C. B. journal boxes with pressed steel lids, P. R. R. "W" springs and 33-in. chilled wheels. The furniture and flat cars will have Buckeye trucks and the former will also have Batten doors and Q & C fastenings and Winslow roofs.

The Montgomery & Chester Electric, Phoenixville, Pa., will need 10 cars for the proposed new electric railroad. John I. Ridgway, Philadelphia, is President. (See Electric Railroad Construction column.)

The Bloomington & Normal, Bloomington, Ill., will want eight open and 16 closed motor cars and three trailer cars. A. E. De Mange is President and Purchasing Agent. (See Electric Railroad Construction column.)

The Brooklyn Avenue road of Kansas City expects to order 45 trolley cars, convertible for summer or winter use. They will have 20 ft. car bodies, single trucks and General Electric equipment. The bids will probably be opened Feb. 15.

BRIDGE BUILDING.

ALBANY, N. Y.—A bill has been passed authorizing \$6,000 to be raised by taxation for the bridge over Onondaga Creek, at West Fayette St.

BOSTON, MASS.—A Board of U. S. Army Engineers has been appointed to give a hearing in the matter of a bridge to be built over the Charles River in place of the present West Boston bridge. Col. Geo. L. Gillespie is chairman.

BOWLING GREEN, KY.—The Warren County Court has authorized the building of two more bridges over Collins River, one at Harrison's Ferry and one at some point in the Fifteenth Civil District, to be selected by the Bridge Committee.

CARROLLTON, KY.—The bridge which will be built across the Kentucky River will be 300 ft. long and 20 ft. wide, of iron or steel, and have stone pillars. The estimated cost is \$75,000. M. J. Baker, or J. J. Orr, County Auditor, may be addressed. (Jan. 6, p. 13.)

CHICAGO, ILL.—Commissioner of Public Works McGinn has asked the city to appropriate \$2,000,000 for new bridges, and \$329,000 for bridge and viaduct repairs for 1899.

Sealed proposals are wanted by March 15 for building (a) sub and superstructure of a railroad bridge across the Des Plaines River, on the line of the C. R. I. & P., in Joliet; (b) for building sub and superstructure for a bridge across the same river at Jefferson St., Joliet; (c) for building the sub and superstructure for a bridge across the Des Plaines River at Cass St., in Joliet. The designs of the bridges and plans and specifications may be seen at the office of the Chief Engineer of the Sanitary District of Chicago. Wm. Boldenweck, President.

CLEVELAND, O.—The steel bridge across Kingsbury Run and the tracks of the Nickel Plate, at Willson Ave., was swept away Jan. 17 by a flood, caused by the bursting of an ice dam.

Chief Engineer G. W. Kittredge, of the C. C. C. & St. L., has asked bids for the building of a rolling lift bridge over the Cuyahoga River. (Dec. 30, p. 936.)

COLUMBUS, O.—The Council Committee on railroads and viaducts has approved the ordinance authorizing the Board of Public Works to prepare plans for a bridge over the tracks of the T. & O. C. Ry. The cost to the city for this work is \$4,355.

CONCORD, N. H.—A resolution appropriating \$6,000 in part payment for a new bridge built to replace one that was washed away by the floods was passed by the State Legislature Jan. 18.

CUMBERLAND, O.—(See Electric Railroad Construction column.)

DAVENPORT, IA.—The Chicago, Rock Island & Pacific has not as yet determined upon the plans for the bridge at Division St. The work will be done by the company's own men. (Jan. 13, p. 31.)

DIXON, CAL.—The Supervisors have ordered the County Surveyor to prepare a suitable plan and specifications for a combination bridge in Vacaville township, at the site of the John Thissell bridge.

EAST ST. LOUIS, ILL.—(See Electric Railroad Construction column.)

ERIE, PA.—The Erie Eastern will require one bridge. (See Railroad Construction column.)

GRAND FORKS, B. C.—A bridge will be built across Kettle River by Mr. Ross, the purchaser of this new town site.

GRAND HAVEN, MICH.—The people of Ottawa county will vote upon a proposition to build three bridges over Grand River. One of the bridges will connect Grand Haven with Spring Lake, the other will be at Eastmanville, and the third will be at the Bridge St. Ferry, 8 miles above Eastmanville. The measure means an expenditure of \$25,000. Chas. K. Hoyt, County Clerk, Grand Haven.

GRASS VALLEY, CAL.—The bridge on Colfax Ave. is unsafe, and is to be rebuilt.

HAMILTON, O.—The County Commissioners have been petitioned for a bridge over Elk Creek, on the road leading to Summersville Pike. H. C. Gray, County Auditor.

HUTCHINSON ISLAND, GA.—On Jan. 21 the Senate passed the bill authorizing the construction of a bridge across the Savannah River from the mainland of Chatham county to Hutchinson Island. The bill passed the House of Representatives Jan. 19. It provides for the construction of a draw-span bridge over the Savannah River for the Georgia & Alabama Ry. (Dec. 16, p. 901.)

JERSEY CITY, N. J.—The Bayonne Common Council has petitioned the Central RR. to build a bridge across the tracks at East Thirtieth St., Bayonne.

LEXINGTON, MO.—The following are reported as directors of the company which is endeavoring to build a bridge over the Missouri River at Lexington: W. G. McCausland, William Aull, John Taubman, J. R. Moorehead, Philip Keller, Albert Grier, J. E. Winkler, Albert Young, Edward Taubman, John S. Blackwell, Ernst Hoffman, Joseph Long and Gustave Haerle. The Lexington Bridge & Terminal Co. are the petitioners mentioned in the bill now pending in Congress for permission to build a bridge at this place. (Dec. 30, p. 936; Jan. 20, p. 50.)

LINCOLN, NEB.—Bids are wanted by Feb. 11 for all bridges to be built in York County in the year 1899. Plans and specifications are ready. J. D. White, County Clerk, Lincoln.

LITTLE ROCK, ARK.—On Jan. 21 the Senate passed the bill authorizing the St. Louis, S. I. & Southern RR. to build a bridge across the White River, in Arkansas. In the House the bill has been referred to the Committee on Interstate and Foreign Commerce. The particulars as to the bill were given in this column Dec. 23 (p. 921).

MEDFIELD, MASS.—(See Electric Railroad Construction column.)

MONTGOMERY, ALA.—Representative Taylor, of Alabama, Jan. 19 introduced a bill authorizing the Montgomery, Hayneville & Camden RR. to build a bridge across the Tom Bigbee River between the northern and southern boundary lines of Clark county. All railroad companies desiring use of this bridge are entitled to equal rights and privileges. It is to be located and built under the directions of the Secretary of War. The bridge must be commenced within one year from the passage of the bill and completed within three years. The bill was referred to the Committee on Interstate and Foreign Commerce.

MORGANTOWN, W. VA.—Representative Dayton, of West Virginia, Jan. 18 introduced a bill authorizing a foot-passenger bridge built across the Monongahela River at Morgantown by the County Court of Monongahela. It is to be built so as to furnish a free and unobstructed passage to all vessels navigating the river, and is to be built subject to regulations of the Secretary of War. Work must be begun within two years and completed within three years from the date of the passage of the bill.

NEWARK, N. J.—According to report, the Erie RR. will build a new bridge over the tracks on Kearney Ave.

NEW YORK, N. Y.—A hearing was given Jan. 17 at the Army Building before Major Henry M. Adams, Corps of Engineers, U. S. A., in the matter of the condemnation of the bridge over Newtown Creek, at Grand St., Borough of Brooklyn.

The Mayor has signed the ordinances authorizing an issue of \$100,000 bonds to continue the preliminary work on the proposed bridges over the East River between Manhattan and Brooklyn and Manhattan and Queens boroughs.

Bids are wanted by Feb. 2 by Bridge Commissioner Shea, for rebuilding the Blissville bridge over Newtown Creek. The appropriation for the work is \$70,000. (June 17, p. 442.)

OGDEN, UTAH.—Bids are wanted Feb. 2 for a steel truss bridge 140 ft. long, and 18 ft. roadway, in Weber county. C. R. Hollingsworth, County Clerk. (Dec. 23, 1898, p. 921.)

PHILADELPHIA, PA.—It has been decided to build a steel and iron bridge over the Schuylkill River at Wissahickon. Plans are not yet prepared. The eastern terminus is to be at the foot of Vassar St., where the bridge will connect by sweeping approaches with Main St.

The Wissahickon Bridge Co. has been formed by John G. Johnson, attorney for the incorporators; James Christie, Albert Major, Charles Major, Frederick B. Johnson and Charles C. Price. Application will be made Feb. 10 for its incorporation to build a steel bridge across the Schuylkill, at a point on the Philadelphia side of the river, 3,000 feet north of City Ave. bridge and 2,990 feet on the Montgomery County side of the river. All the incorporators are connected with the Pencoyd Iron Works.

PHOENIXVILLE, PA.—(See Electric Railroad Construction column.)

PORT ORFORD, ORE.—The Commissioners of Curry county want bids for a new bridge across Elk River. The bids will be considered at the regular April term.

QUEBEC, QUE.—It is stated that the Government has issued notices inviting tenders from United States contractors for the building of the Quebec bridge, and that in the notice the Government binds itself to introduce a vote of \$1,000,000 towards the cost of the bridge at the coming session of Parliament.

ROCHESTER, N. Y.—The question of an iron highway bridge to span Oak Orchard Creek ravine, at Waterport, to cost \$12,000, is to be submitted to the people at the election in March.

RUTLAND, VT.—The U. S. Senate and the House have each passed the bill authorizing the Rutland RR. to build bridges over Lake Champlain. The bill was introduced in the Senate by Senator Proctor on Jan. 12. These bridges were referred to in this column last week.

SALEM, ORE.—The two bridges across Mill Creek, on Front and Commercial Sts., have been declared by the Council as unsafe. Arrangements for their immediate repair will be consummated.

SAN FRANCISCO, CAL.—The Board of Supervisors have decided to spend \$1,200 for a bridge over Bosworth St. at Berkshire St. John A. Russell, Clerk.

SANTA BARBARA, CAL.—The Pacific Improvement Co., of which A. L. Boschke is Superintendent of Construction at Santa Barbara, will let contracts for several bridges on the new Southern Pacific line between Surf, Cal., and Elwood. (See Railroad Construction column.)

SAULT STE. MARIE.—We are informed that there is no truth in the report that the Michigan Lake Superior Power Co. contemplates building new bridges.

SPOKANE, WASH.—Plans are being discussed for a bridge in the vicinity of Chestnut St.

SYRACUSE, N. Y.—A hoist bridge over the Oswego Canal, at Butternut St., is being considered. The city is to raise \$3,500 for the work.

TOPEKA, KAN.—A bridge is to be built across the Kaw River four miles south of Topeka. Senator Anderson has introduced a bill in the State Senate to secure its building.

TORONTO, ONT.—Plans have been prepared, and bids will soon be wanted, for the Kings St. bridge over the Don. C. H. Rust, City Engineer.

VINCENNES, IND.—The Vincennes Bridge Co. has been formed to manufacture steel and iron bridges. J. T. Oiphant may be addressed.

WILSTERLY, R. I.—General Wilson, Chief of Engineers, U. S. A., has acted upon the plans of the N. Y., N. H. & H. RR. bridge over the Sakonnet River. The plans are yet to be approved by the Secretary of War. The State of Rhode Island has appropriated \$20,000 for this work. (Jan. 6, p. 13.)

YANKTON, S. D.—Senator Pettigrew, of S. D., Jan. 17 introduced a bill in the U. S. Senate for the building of a bridge across the Missouri River at Yankton, which is to be a combined railroad, wagon and foot-passenger bridge of unbroken and continuous span of not less than 50 ft. in elevation above extreme high-water mark. Building must be begun within two years and the bridge completed within four. Last February a bill was passed by Congress extending the time for building a bridge at this place four years from June 22, 1898, by a company having secured authority to build. Senator Pettigrew's bill seems to be for a new company to build the bridge.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Chicago, St. Paul, Minneapolis & Omaha.—Annual, 3½ per cent.; semi-annual, preferred, 3½ per cent., payable Feb. 20.

Illinois Central.—Semi-annual, 2½ per cent., payable March 1.

Pullman Palace Car Co.—Quarterly, \$1.50 per share, payable Feb. 15.

Cincinnati, Newport & Covington.—Annual, 1½ per cent., payable Feb. 1.

Federal St. & Pleasant Valley (Pittsburg).—Two and a half per cent., payable Jan. 22.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Society of Civil Engineers.—Meets at the house of the Society, 220 West Fifty-seventh street, New York, on the first and third Wednesdays in each month, at 8 p. m.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7:30 p. m.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

Chicago Electrical Association.—Meets at Room 1737, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, Secretary.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month, except during July and August.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Tuesday of each month, excepting July and August, at 6:30 p. m.

Engineers' Club of Columbus, (O).—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of Philadelphia.—Meets at the house of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month at 8 p. m., except during July and August.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month at 7:30 p. m.

Locomotive Foremen's Club.—Meets every second Tuesday in the club room of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7:30 p. m.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m., excepting June, July and August.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m. Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is Secretary.

Central Association of Railroad Officers.

The Toledo Division of the Central Association of Railroad Officers held an election on Jan. 9, and A. H. Smith, of the Lake Shore & Michigan Southern, was chosen President.

Lake Carriers' Association.

This Association held its annual meeting at Detroit January 24, about 200 members being present. The tonnage represented is about the same as a year ago. Mr. F. J. Firth, of Philadelphia, President of the Anchor Line, was chosen President of the Association.

Technical Club, Chicago.

At the annual meeting, Jan. 21, the following officers were elected for the ensuing year: President, C. F. Quincy; First Vice-President, Charles F. Billin; Second Vice-President, Richard H. Pierce; Treasurer, E. C. Darley; Directors, Maurice Coster, George H. Bryant, Clyde M. Carr, John C. McMynn, J. B. Alain, James R. Chapman, Horace G. Horton.

American Street Railway Association.

An informal meeting of representatives of the Chicago Street Railroad companies was held in Chicago Jan. 17 to take the first steps toward preparing for the meeting of the Association there next fall. A committee was appointed to select a place for the meeting and to arrange for a large exhibition with power to show apparatus in operation. At a second meeting this week the plans formulated will be considered by the Executive Committee.

Illinois Railway and Telegraph Employees' Political League.

This league has been organized in Chicago with the object of opposing legislation against railroads. All salaried officers of railroad and telegraph companies are eligible to membership. A short time ago it was decided to hold a congress of railroad men of the middle Western states to consider means of accomplishing the objects of the Association. The date for this meeting has now been fixed for Feb. 18, when an address will be delivered by the Hon. Chauncey M. Depew on "Anti-Railroad Legislation and Its Effects on the Salaries of Employees." A committee, consisting of J. W. Callahan, general yard master of the Belt Line, and nine others, has charge of the arrangements for this meeting.

American Institute of Mining Engineers.

As already announced, the seventy-sixth (twenty-ninth annual) meeting of the Institute will be held in New York City, beginning Tuesday, Feb. 21. The following programme is provisionally announced:

Tuesday evening, 8 p. m., opening session at hall of the American Society of Mechanical Engineers. At this session a paper, illustrated with lantern views, on "The Copper Queen Mine, Arizona," will be presented by Mr. James Douglas.

Wednesday morning and afternoon, visit to, and session at, Columbia University. Evening, reception and dance at Sherry's.

Thursday morning, session at American Society of Mechanical Engineers' Hall. Afternoon, free for optional excursions. Evening, session at A. S. M. E. Hall.

Friday morning and afternoon, visit to mine and works of the New Jersey Zinc Company. Evening, free for theatres, etc.

Saturday, optional excursions.

Engineers' Society of Western Pennsylvania.

The 10th annual meeting of the Engineers' Society of Western Pennsylvania was held in the lecture room of the Society's Home, No. 410 Penn avenue, Tuesday evening, Jan. 17, 1899.

The following officers were elected: President, H. J. Lewis; Vice-President, H. W. Fisher; Directors, P. T. Berg, Prof. F. C. Phillips; Secretary, R. A. Fesenden; Treasurer, A. E. Frost.

After the adjournment of the annual meeting, the 19th regular meeting was called to order, and the Secretary was instructed to write to the representatives of this district, stating that the pending H. R. bill 10,403, was indorsed by the Engineers' Society of Western Pennsylvania, and urging them to support it.

After a discussion as to the stand the Engineers' Society should take regarding the present agitation for the abatement of the smoke nuisance, the Society adjourned.

Engineers' Club of St. Louis.

The 483d meeting was held Jan. 18, 1899. President Colby in the chair. Thirty-one members and 10 visitors were present. Mr. J. A. Ockerson read the paper of the evening, entitled, "The Southwest Pass of the Mississippi River." The paper described fully the methods of the last survey, and the physical characteristics of the pass, mentioning especially the character of the banks and the peculiar mud lumps which form at various points. The several openings from the pass to the Gulf were mentioned and their dimensions given. Methods used in making soundings, both in the pass and in the Gulf at its mouth, were fully explained, so the accuracy of the survey was apparent. The slope of the river in the pass was stated and the effect of the winds and tides on the slope discussed. The movement of the crest of the bar at the mouth of the pass was described as shown by the surveys of different periods, and the conditions affecting the rate of advance discussed. The advance is due mainly to the rolling of the sand up the rear and down the front of the bar. The most of the silt brought down by the river is deposited before reaching the bar and goes to building up the banks. Where the river divides into the several passes, the discharges of each given in percentages of the total discharge of the river. The plans of the board of engineers appointed to report on the improvement of the S. W. pass were set forth, and the nature of the jetties which they proposed was described; also the necessity for the improvement of this pass was discussed. Drawings and photos were exhibited showing the various points. The discussion following was participated in by Messrs. Flad, Connor, Freeman, Bouton, Colby, Herman, Russell and Turner.

Western Railway Club.

The Western Railway Club held a meeting Tuesday afternoon, Jan. 17, at the Auditorium Hotel, Chicago. The names of nine new members were read, and it was announced that beginning this year it had been decided to furnish each member in good standing a bound volume of the year's proceedings, containing an index of all papers presented before the Club since its organization. This will be in addition to the usual monthly pamphlets containing separate reports of each meeting.

Messrs. J. N. Barr, T. Fields, R. D. Smith, T. Kirby and P. H. Peck were appointed as a committee to recommend changes in the M. C. B. Rules of Interchange. The committee now investigating the subject of M. C. B. couplers stated that it would be ready to report progress at the next meeting.

A paper entitled, "Tests of Locomotive Boiler Coverings," was presented by Mr. Robert Quayle, Superintendent of Motive Power of the Chicago & Northwestern, giving the results of competitive tests made last August near Clinton, Ia., under the supervision of Prof. Goss. A locomotive without fire, the boiler of which was in turn covered with the different materials tried, was supplied with steam from a locomotive in the rear, which also furnished power for moving both locomotives at a speed of about 28 miles per hour. The steam pressure was maintained constant in the forward boiler and precautions were taken so that all condensation in the boiler of the forward locomotive could be assumed to be due to radiation from its exterior surface. The amount of water condensed thus became a basis for comparing the different coverings and it was stated that the tests were intended to give only a commercial measure of the radiation losses from a locomotive boiler under conditions of service, and not to furnish scientific data of great accuracy. Eight coverings were tested in this way, in addition to similar tests with a bare boiler. Standing tests were also made with all coverings and with a bare boiler. Extracts from this paper will be given in a future issue, but at this time it may be said that the results obtained with the different covering materials were in very close agreement. This paper was discussed quite fully.

The programme for the next meeting has not as yet been definitely arranged, but one or more of the following papers will be presented: "The Uses of Compressed Air in Railroad Shops;" "Compound Locomotives," by Mr. E. M. Herr; "High Speed Locomotives," by Mr. C. E. Street.

On Wednesday, Jan. 18, more than 100 members of the Club visited the Niles Tool Works, at Hamilton, O., as the guests of that company.

PERSONAL

(For other personal mention see Elections and Appointments.)

—Announcement is made of the marriage of Mr. H. G. Kelley, Chief Engineer of the Minneapolis & St. Louis, at Denison, Tex., to Miss Cora Lingo, of that city, on Jan. 11.

—Mr. John R. Wagner, Superintendent of Motive Power of the Delaware, Schuylkill & Susquehanna, died at his home in Drifton, Pa., on Jan. 21, after a short illness. Mr. Wagner was a graduate of Lehigh University in 1886.

—Mr. Hallett Alsop Borrowe, at one time Division Superintendent of the Consolidated Traction Co. of

New Jersey, now the North Jersey Street Railway Company, has been made General Manager of the Ferro Carril Urbano, a railroad in Cuba.

—Maj. Jed. Hotchkiss, who was Chief of Engineers to Stonewall Jackson, died in Staunton, Va., Jan. 17. He was a civil and mining engineer. He was born in Broome county, N. Y., 71 years ago, and went South when he was about 20 years of age.

—Mr. David Greene, Secretary and Treasurer of the Case Manufacturing Company, died Jan. 14 in New York at the age of 32. He was much beloved by his associates, and held in high esteem by all who knew him. He was a graduate of Princeton, having finished his college course at about the age of 20, and before he was yet of age he had bought an interest in the Case Company. He entered the shops, working in the various departments for about three years. Between the ages of 23 and 24 he was elected as Secretary and Treasurer, which office he filled successfully until his death.

—Gen. Michel Annenkov, the Russian engineer, who built most of the Trans-Caspian Railroad, died in St. Petersburg on Sunday last, at the age of 61. In 1866 he was promoted to the rank of Colonel, and was for four years in the service of the Imperial Administration. He did a good deal of work in building strategic railroads, and he completed the Trans-Caspian Line, begun by Gen. Skobelev. Gen. Annenkov personally superintended the building of the division between Samarkand and Tashkend. He was a strong advocate of the Trans-Siberian railroad, and it was largely through his efforts in 1851 that the support of French capitalists was secured for the enterprise. On another page of this paper will be found an interesting sketch of the work of Gen. Annenkov on the Trans-Caspian line, taken from an article which was written by the General himself a few months ago. Gen. Annenkov's success in the Transcaspian enterprise is the more remarkable from the fact that his predecessor, a high military officer of much experience, had declared that the difficulties due to the drifting sand would be insurmountable.

—Prof. J. B. Johnson, M. Am. Soc. C. E., will leave Washington University, St. Louis, to go to the University of Wisconsin as Dean of the College of Mechanics and Engineering. He enters the service of the University of Wisconsin Feb. 15, but will go abroad in March and spend the summer in studying the engineering and industrial schools of the Continent. In his new position, which is also new in the University, his work will be largely administrative, although he is expected to do some teaching, and his duties will cover all departments of engineering. These departments in the University of Wisconsin are quite liberally supported, as 1 per cent. of the entire state railroad tax goes to their equipment. This permits a large annual expenditure to be made for permanent plant. Prof. Johnson is a man of extraordinary energy and devotion, and with the experience which he has behind him from years of teaching and laboratory work at Washington University, and with the considerable money at his disposal, we may expect that the engineering departments of the University of Wisconsin will develop rapidly, and so be an important addition to the great opportunities which young Americans now have to get a scientific education.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—Francis T. A. Junkin, Railroad Attorney for Turner, McClure & Rolston, counsellors for the Farmers' Loan & Trust Co., has been appointed Attorney for the A. T. & S. F., and will have his headquarters in Chicago, Ill. He will assume his new duties Feb. 1.

General Manager J. J. Frey will hereafter have personal supervision of the Tax Department, relieving General Solicitor E. D. Kenna to this extent.

William E. Bailey has been appointed Auditor of the Sante Fe, Pacific & Southern California, subordinate lines of A. T. & S. F., succeeding C. E. Crary, resigned.

Baltimore, Chesapeake & Atlantic.—Willard Thompson, General Manager, has resigned. Mr. Thompson has been connected with the company since its inception. He was at one time Receiver of the Baltimore & Eastern Shore.

Butte, Anaconda & Pacific.—A. R. Cook, heretofore Assistant Engineer, has been appointed Resident Engineer, with headquarters at Great Falls, Mont. He succeeds J. C. Patterson, resigned.

Canadian Pacific.—James O'Bourne has been appointed Superintendent of the Western Division, with headquarters at Winnipeg.

Chesapeake & Ohio.—F. T. Walker, General Agent at Louisville, Ky., has been transferred, with headquarters at Richmond, Va. He succeeds H. L. Watkins, General Agent at Richmond. J. T. Odell has been appointed General Agent to succeed Mr. Walker. The changes are effective Feb. 1. C. C. Divine, Traveling Freight Agent of the Kanawha Dispatch, at Memphis, succeeds Mr. Odell.

Chicago Great Western.—M. E. Newell has been appointed General Agent at Pittsburgh, succeeding J. F. McFarlane, resigned.

Cleveland, Cincinnati, Chicago & St. Louis.—K. Connor has been appointed Supervisor of the Michigan Division, with headquarters at Anderson, Ind. William C. Taylor has been appointed Engineer of Maintenance of Way of the Wabash district, with headquarters at Wabash, Ind.

William Quinn has been appointed Superintendent of the Cincinnati & Sandusky Division.

Colorado & Southern.—Fred. Wild, Jr., General Freight Agent, has resigned, and in future will be connected with the Colorado Fuel & Iron Co., his headquarters to be at Pueblo. His successor is H. A. Johnson, who was formerly General Agent for the Union Pacific.

Fitchburg.—F. O. Melcher has been appointed Acting General Superintendent, assuming the duties of the position recently vacated by C. L. Mayne, General Superintendent. His headquarters are at Boston, Mass.

Erie.—The following promotions, effective Feb. 1, have been announced: Washington Lavery, Assistant Superintendent Motive Power, Erie Lines West of Salamanca, transferred to similar position on the lines east of Salamanca; George Donahue, present Master Mechanic at Meadville, to succeed Mr. Lavery; Willard Kells, present Master Mechanic of the Chicago & Erie at Huntington, transferred to Meadville; J. McLaren, present foreman at Chicago, to succeed Mr. Kells; M. Mercator, present foreman at Youngstown, to succeed Mr. McLaren.

Fort Plain & Richfield Springs.—At the annual meeting on Jan. 12, the new directors of this line referred to in the Construction column were elected as follows: Chas. Seidler, James G. Janeway, J. C. Holden, Robert D. Farlee, Horace Moody, A. M. Farnum, W. I. Kent, New York; Andrew R. Smith, Springfield Center, N. Y.; Warren Hawn, Starkville, N. Y.

Great Northern.—Charles W. Graves has been appointed District Freight and Passenger Agent, with headquarters at Toronto. The office of Assistant Superintendent of the Northern Division is abolished. E. E. Lillie has been appointed Assistant Superintendent of the Montana Division, with headquarters at Havre, Mont.

Kansas City, Pittsburgh & Gulf.—F. H. Keeshen has been appointed Trainmaster, with headquarters at Pittsburgh. A. J. Johnston has been appointed Trainmaster of the Middle Division, with headquarters at Mena, Ark. J. R. Williams has been appointed Trainmaster of the Southern Division, with headquarters at Shreveport, La.

Kansas Southwestern.—The following are the officers of the K. S., successor to the St. Louis, Kansas & Southwestern: Samuel Barker, President, Hamilton, Ont.; James N. Young, Vice-President and General Manager, Arkansas City, Kan.; A. N. Brown, Traffic Manager, Arkansas City, Kan.; Auditor, Chas. Stiff, Arkansas City, Kan.

Lake Erie & Western.—F. Sullivan, General Roadmaster for forty years, has resigned.

Mahoning Valley (Buffalo, Rochester & Pittsburgh).—At the annual meeting of the stockholders, held Jan. 16, in Youngstown, O., the following directors were chosen: James Parmalee, B. F. Miles, M. A. Verner, W. H. Lawrence, J. G. Butler, Jr., C. F. Clapp, R. G. Sykes and A. A. Anderson. M. A. Verner was chosen President, to succeed B. F. Miles. Mr. Miles has been elected President of the American Linseed Oil Co.

Manhattan.—Alfred Skitt, the new Vice-President, in his first general order, announces the appointment of George H. Pegram as Chief Engineer and John Waterhouse as Consulting Engineer. Both appointments took effect Jan. 23. Mr. Pegram was formerly Chief Engineer of the Union Pacific, and became Consulting Engineer of the Manhattan Ry. of New York about a year ago.

Mankato & New Ulm.—The officers and Directors of this company referred to in the Construction column, are as follows: Marvin Huggett, President; M. M. Kirkham, Vice-President and Treasurer; J. B. Redfield, Secretary; Charles E. Johnson, Assistant Secretary. Directors, J. M. Whitman and J. B. Redfield, Chicago; Ed. C. Carter, Evanston, Ill., and W. A. Scott and J. C. Stuart, St. Paul.

Oconee & Western (Wrightsville & Tennille).—The jurisdiction of the officers of the Wrightsville & Tennille has been extended to include the line of the O. & W., recently absorbed.

Ogden & Hot Springs.—At the annual meeting held in Hot Springs, Utah, Jan. 15, the following officers were elected: W. A. Paxton, President; Frank J. Hirt, General Manager; M. Kennedy, General Superintendent, and Fred. Greene, General Passenger and Ticket Agent. The headquarters are at Hot Springs, Utah. C. M. Clay has been heretofore General Manager.

Pittsburgh, Fort Wayne & Chicago (Pennsylvania Co.).—Thomas J. Foley, heretofore Assistant Trainmaster, has been appointed Inspector of Transportation.

Northern Pacific.—Howard Curry has been appointed Road Foreman of Engines, for the district east of Mandan, N. D.

St. Louis Southwestern.—We are officially informed that the jurisdiction of A. B. Liggett, Superintendent of the Waco Division, has been extended to include all lines in Texas, with headquarters at Tyler, Tex. J. H. White, Superintendent Ft. Worth Division, has been transferred to other duties. J. J. Kress is appointed Trainmaster of the Texarkana, Ft. Worth and Sherman sections, including Dallas, with headquarters at Commerce, Tex. J. W. Metcalf is appointed Trainmaster of the Mt. Pleasant, Tyler, Waco and Hillsboro sections, with headquarters at Tyler, Tex. Effective Jan. 19.

Utah & Pacific.—Jas. Latimer has been appointed Roadmaster, with headquarters at Nephi, Utah. This is a new company, partially finished.

Wabash.—J. H. McClure has been appointed Road Foreman of Engines for the Eastern Division from Detroit to Buffalo. His headquarters will be in Detroit, Mich.

RAILROAD CONSTRUCTION, New Incorporations, Surveys, Etc.

ANNISTON & COOSA COAL FIELD.—This company has been incorporated in Alabama, with a capital stock of \$250,000, to build a line from Anniston northwest about 40 miles, into the Coosa coal fields in St. Clair county, to connect with the Alabama Great Southern. The incorporators are: W. F. Johnston, G. B. Randolph, F. M. Hight, J. S. W. Kee, H. W. Sexton and J. C. Sprowell, all of Calhoun county.

ARKANSAS & CHOCTAW.—Both houses have passed the bill authorizing this company to build its line through the Choctaw and Chickasaw Nations, in Indian Territory. (Jan. 20, p. 52.)

ARKANSAS & NORTHWESTERN.—This company was incorporated Jan. 18, with a capital stock of

\$150,000, to build a line from Hope, Ark., northwest about 25 miles to Stamps. The Directors are: J. T. West, W. I. Foster, S. L. Bracey, J. H. Block and J. H. McCollum.

ARKANSAS & OKLAHOMA.—A bill has been introduced into the Arkansas House to grant this company 1,000 acres of land for each mile of road built. The line has just been completed from Bentonville, Ark., northwest 17 miles to Gavett. (Oct. 14, 1898, p. 750.)

BIRMINGHAM AIR LINE.—Press reports from Birmingham, Ala., state that this company is being organized to build a line from Birmingham south to Pensacola, Fla. Jas. P. Harrison, of the Howard-Harrison Pipe Works, Birmingham, is among those interested.

BOISE, NAMPA & Owyhee.—This line, which was completed last year from Nampa, Idaho, south to Guffey, 24 miles, is to be extended from Nampa north about 300 miles, via Long Valley and the Seven Devils' mining district to Lewiston. (Jan. 21, 1898, p. 50.)

CHESTERFIELD & LANCASTER.—This company has been incorporated in South Carolina to build a line from Cheraw, on the Seaboard Air Line, to the Ohio River & Charleston. Chester county is reported to have subscribed \$50,000 of county bonds to aid the road. W. P. Pollock, of Cheraw, S. C., is one of the projectors.

CHICAGO, MILWAUKEE & ST. PAUL.—An extension of the Fonda branch of the Des Moines Northern & Western, recently acquired, will be made, according to report, from Fonda, Ia., northwest 100 to 125 miles, either to Canton, S. D., or to Sioux Falls. A bill recently passed the Senate permitting the building of a bridge over the Missouri at or near Chamberlain.

The General Manager writes that the company has no present intention of extending its line from the Missouri River west to the Black Hills. (Jan. 13, p. 33.)

CLEARWATER SHORT LINE.—Senator Heitfeld, of Idaho, on Jan. 18 introduced a bill into the Senate granting right of way to this company through the lands in the former Nez Perce Indian reservation in the state of Idaho. This company is a subordinate line of the Northern Pacific, and the right of way is to form part of the proposed extension of 75 miles from Lewiston east, now building. (Nov. 25, 1898, p. 852; N. P., Dec. 23, 923.)

DAKOTA SOUTHERN.—Senator Pettigrew, of South Dakota, on Jan. 19 introduced into the Senate a bill granting this company right of way from east to west across the Yankton Indian lands in South Dakota. The bill went to the Committee on Indian Affairs.

DENVER & RIO GRANDE.—The company has prepared to standard gage its line from La Veta, Colo., to Alamosa, 60 miles. In doing this, there will be built a cut-off of 26½ miles. The contracts for the work are let, the principal contractors being Clough & Anderson, of Colorado Springs, Colo. The maximum grades over the summit on Veta Pass will be 3% for westbound trains for 13 miles, and 2½% for eastbound trains for 2½ miles. There will be three tunnels aggregating about 1,500 ft., all through solid rock. The maximum curvature will be 12°. No new securities will be issued, but the cost will be met out of the assets in the treasury. (Official.)

EL PASO & NORTHEASTERN.—Geo. S. Good & Co., of Lock Haven, Pa., write that work is to be begun at once on the new contract for the extension from Alamogordo, N. M., north 92 miles to Salado. (Jan. 20, p. 53.)

ERIE EASTERN.—Dr. B. A. Smith, of Erie, Pa., President of the Citizens' Industrial Association, has forwarded a report as to this proposed line from G. Lyman Moody, a civil engineer of that city. The route, as proposed, is from Erie Harbor, Pa., south 20 miles via Waterford to Millville, Erie county. Only preliminary surveys are made, and parties are to take the field Feb. 1. Building is to be begun March 1, and the line is to be completed into Erie by Aug. 1. Hoover & Stern, of Columbus, O., are reported to have a contract. There will be no bridges, except one over French Creek, of perhaps 200 ft. span, with trestle approaches. The officers are given under Elections and Appointments. (Oct. 15, 1897, p. 736.)

FORT PLAIN & RICHFIELD SPRINGS.—At the annual meeting of the stockholders, recently held, it was determined to begin building this line at an early date. The road as projected is to run from Richfield Springs, N. Y., to Fort Plain, 22 miles. It is said to be graded and the bridge abutments built, but no rails are laid. The property has been in the hands of the courts for some time. (Railroad News column, Sept. 2, 1898, p. 640.)

GAINESVILLE, M'ALESTER & ST. LOUIS.—The House has passed the bill granting this company right of way through the Indian Territory, and it is now before the Senate. (Dec. 30, 1898, p. 938.)

GEORGIA ROADS.—The Cherokee Mining & Manufacturing Co., Chattanooga, Tenn., has completed about two-thirds of the grading on its line from Lely, Ga., to Colyarton, Ala., 9½ miles. (New Roads, Dec. 30, 1898, p. 938.)

The Willis & Cole Lumber Co. of Blakely, Ga., is reported interested in the proposed line from Blakely on the Central of Georgia, to run about 10 miles into lumber lands.

GREAT NORTHERN.—Surveys are reported in progress for a cut-off from Milan, Wash., on the main line, west 12 miles to Loon Lake, on the Spokane Falls & Northern line, which will cut off about 40 miles on the route to Rossland and the Kootenay country.

GULF, TEXAS & NORTHERN.—The Texas Railroad Commission has authorized the issue of bonds at the rate of \$17,370 per mile on 188 miles of road from Orange, Tex., north to Marshall. The company was incorporated about six months ago. (Dec. 16, 1898, p. 903.)

HARRISBURG & SOUTHERN.—This company was incorporated in Illinois Jan. 16, with a capital stock of \$600,000, to build a line from a point on the Eldorado branch of the Illinois Central, near Eldorado, to run south through the counties of Saline, Pope and Hardin to a point on the north bank of the

Ohio, and from Harrisburg west through Saline and Williamson counties to Marion. The principal office is Chicago. The incorporators and first Board of Directors are: Seth F. Crews, Ralph Crews, A. D. Percy and A. T. Wells, all of Chicago, and S. S. Berger, of Eddyville, Ill.

INTERURBAN.—Final surveys have been made for this line, from Philadelphia, Pa., west 80 miles via Fernwood, Lansdowne, Clifton, Westchester, Unionville and Quarryville, to Lancaster. The money has been obtained for building, and contracts will be let early in the spring. Winslow Mason, of 1001 Chestnut St., Philadelphia, is President. (Dec. 30, 1898, p. 938.)

JEFFERSON CITY, FORT SCOTT & SOUTHWESTERN.—This company is incorporated in Kansas, with a capital stock of \$4,000,000, to build a railroad from Jefferson City, Mo., southwest about 300 miles through Fort Scott, Kan., to the Kansas state line in Cowley county. The incorporators are: Reuben L. Dewey, St. Albans, Vt.; John E. Frost and E. F. Ware, Topeka, Kan.; Wm. C. Gunn, Fort Scott, Kan., and L. A. Bigger, Hutchinson, Kan.

LEHIGH VALLEY.—This company is reported to be getting right of way for a branch from the main line at South Plainfield, N. J., to run north to Plainfield, and thence on to a point on the main line.

LONG ISLAND.—This company is building the inclined plane in Brooklyn to connect its tracks with the Brooklyn Elevated RR. at Flatbush Ave. Work was begun Jan. 18 with about 100 men. Plans for this improvement were made several months ago. The first effort of the two companies will be to establish a rapid transit route from Jamaica, L. I., to New York, by way of the bridge.

Senator Marshall, of Brooklyn, introduced on Jan. 19 three bills with reference to this road, as follows: First, that the Long Island and the city join in depressing and elevating the railroad tracks, in order to get rid of steam on Atlantic Ave. Second, the Long Island is granted the right to operate these franchises on the surface of its right of way on Atlantic Ave., but without steam. Third, the provision of the city charter limiting new railroad franchises to 25 years, at the end of which time they revert to the city and must be sold again, is abrogated so far as tunnel roads are concerned. This bill would be of advantage in the proposed tunnel under the East River, which has been under consideration for some time. (Feb. 25, 1898, p. 224; Oct. 7, 1898, p. 732.)

M'CLOUD RIVER.—This company, which completed last year a line from Upton, Cal., on the Southern Pacific, south 20 miles to McCloud, will build 12½ miles of its extension toward Aturas, 40 miles from McCloud. (April 15, 1898, p. 285.)

MANKATO & NEW ULM.—This company was incorporated in Minnesota Jan. 14, with a capital stock of \$50,000, to build a line from Mankato to New Ulm, 30 miles. The incorporators and directors, who are also officials of the Chicago & Northwestern, are given under Elections and Appointments. This proposed line is said to be in the interest of the C. & N., and will save 14 miles on through traffic between the two cities. Two routes have been surveyed.

MISCELLANEOUS COMPANIES.—The Brooklyn Co., of New York City, has been incorporated with a capital stock of \$300,000, as a general construction company, to build railroads among other work. The directors are: H. E. Wade, Robert A. Pearson and Alexander Black, of Brooklyn, N. Y.

MINNESOTA ROADS.—The logging road of Powers & Simpson of Hibbing, Minn., to run from that place west 22 miles to the Prairie River at Crooked Lake, is reported completed. (New Roads, Nov. 18, 1898, p. 838.)

MISSISSIPPI RIVER, COLESBURG & MANCHESTER.—This company expects to begin building as soon as bonds can be sold or contracts made to take the bonds upon completion of the road. The line, as projected, is from Colesburg, Delaware county, Ia., to run southeast 16 miles via Petersburg and New Vienna, to Dyersville, connecting with the Chicago Great Western. W. C. Kirchheek, of Colesburg, Ia., is Secretary. (May 14, 1897, p. 345.)

MORGANTOWN & KINGWOOD.—This company is incorporated in West Virginia, with a capital stock of \$200,000, to build a line from Morgantown to Kingwood, 12 miles. The incorporators are: S. H. Gowing, Syracuse, N. Y.; Geo. C. Sturgiss and A. J. A. Martin, of Morgantown, and Geo. M. Whitescarver and Thomas E. Davis, of Grafton, W. Va.

MUSCATINE NORTH & SOUTH.—The last spike was driven on the morning of Jan. 16 on this line from Muscatine, Ia., south 30 miles via Fruitland, Grand View and Wapello to Elrick Junction. The first train trip was made over the road on the same day. W. R. Stewart, Jr., is President and General Manager. (Dec. 30, 1898, p. 938.)

OHIO RIVER & CHARLESTON.—The proposed extension from Gaffney to Spartanburg, S. C., 20 miles, will probably be built early this year. (Feb. 4, 1898, p. 88.)

OREGON RAILWAY & NAVIGATION.—The Clearwater Valley, a subordinate line of this company, incorporated about two months ago (Nov. 11, p. 820), has filed supplementary articles of incorporation for extensions in Idaho and Oregon. The company's line includes the Clearwater Valley extensions from Wallula Junction, Wash., east 140 miles to Lewiston, Ida., and from Lewiston southeast to Camas Prairie, both now building. On Jan. 19 the Senate passed a bill introduced by Senator Shoup, granting the Clearwater Valley right of way 100 ft. wide through the Nez Perces lands in Idaho. (Jan. 13, p. 33.)

PHILADELPHIA, LOUISVILLE & GREAT NORTHERN.—The complete surveys for this line from Philadelphia, Miss., north 42 miles, via Louisville to Ackerman, show grades not to exceed 1 per cent., and a maximum curvature of 3°. R. L. Engle of Ackerman, Miss., is Chief Engineer. (Dec. 2, 1898, p. 868.)

PORT HURON & LEXINGTON.—This company on Jan. 19 filed amended articles of association with the Secretary of State of Michigan, to change the corporate name to the Port Huron, Lexington & Western. The company was incorporated five years ago, and in 1895 graded and practically completed its line from Port Huron, Mich., north 20 miles along

the lake to Lexington. Edward H. Brennan, of Toledo, O., was then President. It is proposed to extend the road west to Bay City. (June 21, 1895, p. 419.)

PORTSMOUTH & CAREY'S RUN.—This company has been incorporated in Ohio to build the proposed extension of the Cincinnati, Portsmouth & Virginia (Nov. 11, 1898, p. 820) from the main line at Wharton, O., three miles from Portsmouth, to run along the west side of the Scioto River, to the Carey's Run stone district, about 30 miles.

RED RIVER VALLEY.—This line projected from Rothwell, Ky., southeast about 45 miles to Salyersville, has been completed from Rothwell to McCausey and Apperson, 15 miles, and grading is in progress on the extension of one mile. The company was incorporated in Kentucky last year. James Muir of Rothwell, Ky., is General Manager. (May 27, 1898, p. 333.)

RUTLAND.—The company has advertised for proposals for grading, masonry and track laying on the Rutland & Canadian extension from Burlington, Vt., north about 60 miles through the chain of islands in the northern part of Lake Champlain to Alburgh, to connect with the Ogdensburg & Lake Champlain, recently bought. (Nov. 18, 1898, p. 839.)

SAGINAW SOUTHERN.—Track is laid for 11 miles on this line from Williams, Ariz., south 47 miles to Jerome. The company expects to build about 75 miles of spurs in the lumber and mining country through which it passes. J. C. Brown of Williams, is President and General Manager, and J. B. Girard, Chief Engineer. (Jan. 13, p. 33.)

ST. LOUIS, IRON MOUNTAIN & SOUTHERN.—The General Manager confirms the report that surveys are in progress from Piedmont, Mo., north to Bismarck, with a view to securing a lower grade line. Building, however, will not be determined until survey and estimates have been completed. (Jan. 13, p. 33.)

ST. LOUIS, TECUMSEH & LEXINGTON.—Congressman Stephens, of Texas, introduced a bill into the House on Jan. 17, authorizing this company to build a line from Oklahoma Territory, to run from a point near Stroud, on the recently completed extension of the St. Louis Southwestern, west about 60 miles via Burnett, to Lexington. The company was incorporated in Oklahoma Territory March 22, 1898, with a capital stock of \$800,000. (April 1, 1898, p. 246.)

SAN FRANCISCO & SAN JOAQUIN VALLEY.—The company has completed its line from Visalia, Cal., to Corcoran Junction, 24 miles, and trains were to begin running this week. (Oct. 14, 1898, p. 750.)

SEABOARD.—The company has completed its line from Tiger's Station, Ala., northwest seven miles to Turner's, and proposes to extend from Turner's to Healing Springs, 15 miles. At least five miles of this extension will be built during the coming year. (July 29, 1898, p. 555.)

SEABOARD & GULF.—This company has been formed to build a railroad from Anderson, S. C., south across the state of Georgia to Carrabelle, Fla., on the Gulf of Mexico, about 450 miles. The capital stock is \$1,000,000. Geo. M. Brinson of Stillmore, Ga., and George Ketchum of Macon, Ga., are stockholders.

SHEBOYGAN & WESTERN.—This company has been incorporated in Wisconsin to build a line from Sheboygan southwest about 20 miles, to connect with the Chicago, Milwaukee & St. Paul, probably at Randon Lake. Among the incorporators are: A. Mendelsohn, Grand Rapids, Mich.; Jerry Donohue, Frank L. Roenitz and Geo. B. Mattoon, of Sheboygan.

SOUTH BRANCH.—This road was built last year from Mead Run Junction, Pa., to Jury, five miles, and the company will build an extension of seven miles during the coming year. H. C. Rich of Granere, Pa., is President.

SOUTHERN PACIFIC.—Work is much more active recently on the gap along the Pacific between Surf, Cal., and Elwood. When completed, this will form a new route for both passenger and freight traffic between San Francisco and Los Angeles. The present route is laid in the interior of the state, over heavy mountain grades, and through some hot and uninteresting valleys. In this new link there is much heavy work, requiring two or three tunnels and some large bridges. The grading is being done by the Pacific Improvement Co., of which A. L. Boschke is Superintendent of Construction, with headquarters at Santa Barbara. It is understood that sub-contracts will be let for bridges and tunnels. (Jan. 20, p. 53.)

Engineers are reported making surveys in Utah and Nevada for a line from Beaver, Neb., southwest through Meadow Valley, Nevada, and Overton to Mojave, Cal. Part of the route is along the proposed line of the Utah & Pacific, now building.

STONE MOUNTAIN.—This company expects to build early this year 18 miles of line from Stone Mountain, N. C., to Roaring River. G. W. Hinsaw of Winston, N. C., is President. (Aug. 27, 1897, p. 611.)

TEXAS, SABINE VALLEY & NORTHWESTERN.—This company, which owns a line from Longview, Tex., south 40 miles to Boren, will begin work about March 1, according to report, on an extension of about 200 miles south to Sabine Pass.

TOLEDO & NORTHWESTERN.—Grading is completed for 20 miles on this line from Albion, Mich., north to Charlotte, and the company expects to lay track between these points early in the spring. Green B. Raum of Chicago, is President. (Oct. 21, 1898, p. 769.)

TOPEKA, WESTMORELAND & WATERVILLE.—This company is incorporated in Kansas, with a capital stock of \$3,000,000, to build a line from Topeka, northwest 90 miles to Waterville. The incorporators are: C. S. Gleed, J. W. Gleed and D. E. Palmer, Topeka; Thomas Norton, Chicago, and R. Spring, Boston.

WATONWAN VALLEY.—This company is incorporated in Minnesota, with a capital stock of \$600,000, to build a line from a point on the Chicago, St. Paul, Minneapolis & Omaha near Madelia, to run south 40 miles through Fairmount to the Iowa state line. This incorporation is said to be in the interest of the Chicago & Northwestern. The incorporators are Thomas Wilson, W. A. Scott, J. T. Clark, J. C. Stuart and L. A. Robinson.

WEST VIRGINIA & KENTUCKY.—Surveys are completed for this line from Devon, W. Va., south eight miles to Paw Paw, Pike county, Ky., and the company proposes to begin building in April. The company was incorporated early this month. F. C. Fischer, of Coalgrove, O., is President. The company's headquarters are at Paw Paw, Ky. (Jan. 13, p. 34.)

Electric Railroad Construction.

AKRON, O.—The Akron, Bedford & Cleveland Electric Ry. has secured right of way for the proposed eight-mile branch from a point above Cuyahoga Falls to Hudson. This work is to be completed by May 1. F. J. Sloat is Superintendent. (Jan. 13, p. 34.)

ALTON, ILL.—The Alton & East Alton Ry. & Power Co. was incorporated Jan. 18, with a capital stock of \$100,000. The incorporators are O. S. Stowell, H. S. Baker and G. M. Ryne.

ALLENTOWN, PA.—The Allentown & Slatington St. Ry. Co., which was chartered in Pennsylvania Dec. 2, 1897, has secured a franchise in Slatington to use the streets of that city for the proposed railroad. The Hon. Hugh E. Criley is at the head of the company. (Dec. 16, 1898, p. 904.)

APPLETON, WIS.—According to report, the Fox River Valley Electric RR. will build an extension to Kaukauna from Appleton, a distance of about six miles. F. G. Kurz, Superintendent.

ATLANTA, GA.—The Atlanta Consolidated St. Ry. Co. has been granted a franchise for an extension on Lee St., and work has already been begun. Several other extensions are proposed, including the Inman Park line from Inman Park to Kirkwood, two miles; the waterworks extension, about one mile, and the Spring St. extension.

BALTIMORE, MD.—The Baltimore Consolidated Ry. Co. has completed a survey along the Frederick Turnpike from Ellicott City to St. John's College, Howard County, a distance of about six miles, for a proposed single track extension. The agreement is yet to be made with the Turnpike Co., of which Allan Dorsey is General Manager. (Dec. 9, p. 886.)

The directors of the Rockville & Washington Electric RR. have made the required cash payment to the Montgomery County Commissioners for right of way over the Rockville and Bethesda Turnpike, on which they were recently granted a franchise. Oscar T. Crosby, President of the City & Suburban of Washington, D. C., is President. (Jan. 6, p. 16.)

BLOOMINGTON, ILL.—The Bloomington & Normal Ry., which was incorporated June 17, 1898, will build three miles of extensions that will need two iron bridges with stone abutments. The number of cars for the road are reported in the Car Building Department. The officers of the company are: President and Purchasing Agent, A. E. DeMange; Vice-President, John Graham; Secretary, Willis E. Gray; Treasurer, J. F. Evans; Manager, John Eddy; Superintendent, Wm. Irvine. (June 17, 1898, p. 445.)

BRIDGETON, N. J.—The Bridgeton & Melville Traction Co., which now operates 18 miles of railroad, is preparing to build an extension from Fairton to Cedarville this spring. A hearing for right of way will be given in Lawrence Township Feb. 1. C. H. Kuhn is President.

BROCKTON, MASS.—A special meeting was held in New Bedford Jan. 19 for a hearing on the petition of the New Bedford, Middleboro & Brockton St. Ry. Co. for a right of way through the town. This company was chartered in February, 1898, to build an electric railroad from New Bedford to Bridgewater, and there connect with the Brockton, Bridgewater & Taunton. Rufus A. Soule, New Bedford, Mass.

BUCYRUS, O.—According to report, the Bucyrus-Galion-Crestline Electric RR. Co. has been granted a franchise in Galion, and has filed a bond for \$5,000 to have cars in operation within six months. (Dec. 30, 1898, p. 939; Jan. 6, p. 16.)

CHARLESTON, ILL.—The City Council on Jan. 19 granted a 50-year franchise to the Charleston & Mattoon Electric St. RR. Co., with permission to use any motive power except steam or horses. The ordinance provides that the road must be in operation Nov. 1, 1900, and that after 30 years the Council shall have power to regulate fares, which are to be five cents until then. The cities of Charleston and Mattoon are 12 miles apart, and it is expected that through service will be put in operation first and local service established later. The C. & M. E. was incorporated last fall with a reported capital stock of \$125,000. Forbes Holton and M. R. Williams are among the incorporators. (Nov. 25, p. 853; Dec. 9, p. 886.)

CHICAGO, ILL.—The Wisconsin Island Lakes & Chicago Electric Ry. Co. had a hearing Jan. 12 by the Board of Aldermen for a franchise for the proposed railroad. President Case says, if given a franchise, the company would build its road on the North Side below the surface of its right of way, but in open cuts. This company first proposed to build a surface trolley railroad. (June 17, p. 445.)

CLEVELAND, O.—We are informed that the Cleveland & Eastern RR. Co. is now building 36 miles of the proposed electric railroad. Grading is almost completed, and track-laying will be begun in February. Contracts are let for track-laying, and for the bridge and trestle work, but other contracts are to be let for grading of seven miles. The two bridges on the road are one iron, 140 ft., and one of wood, which is 50 ft. H. P. McIntosh is President, and W. C. Jones, Chief Engineer. (Jan. 20, p. 54.)

CUMBERLAND, MD.—Surveys are being made for the Smith-Cumberland Electric Ry. Co. John W. Burdin, of Moundsville, W. Va., is President. (April 15, 1898, p. 285.)

DAYTON, O.—The City Ry. Co., which recently secured control of the Dayton & Western Traction Co., is surveying for an extension from Eaton to Richmond, Ind. (Jan. 20, p. 57.)

DETROIT, MICH.—The line of the Detroit, Plymouth & Northville Ry., which is building from De-

trolt through Dearborn, Wayne, Plymouth and Northville, is about completed, and will soon be in operation. John C. Calahan, Wyandotte, Mich. (June 24, 1898, p. 467.)

It is stated that the Detroit & Pontiac Electric Ry. has offered the city \$25,000 for a franchise for a third track in Saginaw St.

EAST ST. LOUIS, ILL.—A. N. Rooks, of Breese, Ill., Superintendent of Building and Right of Way of the proposed electric railroad between Vincennes and East St. Louis, makes the following statement of the plans for the building of the road:

This electric line will be built by the Wabash & Mississippi Construction Company, whose headquarters will be in Salem, Ill. The company has been incorporated for the purpose of building an electric line from Vincennes to East St. Louis. The road will follow the old State road, and will, therefore, be almost parallel with the Baltimore & Ohio Southwestern RR., passing through Olney, Clay City, Flora, Carlyle, Trenton and Lebanon. There are many reasons for believing that the road will be a paying investment and a great accommodation to the people. In the first place, there will not be very much grading to do, since the line will be built on the old Vincennes dirt road. Over 100 miles are now ready for the rails. In low lands the road will require some grading, but, on the whole, this will amount to very little. The bridges will have to be strengthened and kept in repair, but, taking all the advantages offered by a solid roadbed, it must be admitted that it will be a great saving. We have all the financial aid and backing we want. Work will be begun on the road at Vincennes early in the spring, so as to reach Lebanon and East St. Louis by next fall.

EAST ST. LOUIS, MO.—The St. Clair County Board of Supervisors has granted a franchise to the Mississippi Valley Ry. Co. for an electric railroad through St. Clair County on Collinsville road. The franchise is for 20 years, to be accepted within one month; work to be begun by June and to be finished in one year. (Jan. 13, p. 34; Jan. 20, p. 54.)

EVANSVILLE, IND.—R. L. Worell, W. L. Caten and W. C. Henning, all of Dayton, O., are reported as being the promoters of the electric railroad to be built between Dayton, O., and Evansville, Ind. (Dec. 2, 1898, p. 868.)

EVERETT, WASH.—According to reports, agents for John D. Rockefeller are preparing plans for a large electric lighting plant on the Pacific Coast. It is proposed to furnish power to operate the Everett & Monte Cristo RR. by electricity. This is a steam road, 65 miles long. The Everett Ry. & Electric Co. is to be operated with the new undertaking. Gardner Colby, No. 1 Broadway, New York, is President of the E. Ry. & E. Co.

FORT WAYNE, IND.—According to report, a stock company has been organized to build an electric railroad from Orland, Ind., to Fort Wayne, through Waterloo. The stockholders reported are: Ex-Judge Stephen A. Powers, J. A. Waller, Solomon A. Wood of Angola; Judge John F. Shuman of Waterloo; D. A. Garwood, M. E. Griswold and Judge Frank S. Raley of Auburn, and Nicholas Ensley of Indianapolis. It is proposed to begin building the road from Orland to Angola early in the spring. A rate of one cent a mile will be made, and a freight tariff proportionately low. Last week the Northeastern Indiana St. Ry. was reported incorporated with some of the above directors. (Jan. 20, p. 54.)

GEORGETOWN, MASS.—The Georgetown, Rowley & Ipswich St. Ry. Co. is being organized to build an extension of the Haverhill, Georgetown & Danvers St. Ry. through Georgetown, Byfield, Rowley and Ipswich. The company will be capitalized at \$150,000, and the directors are practically the same as the H. G. & D. They are: Charles E. Barnes of Plymouth (Chairman), Arthur Bishop of Rowley, W. B. Ferguson of Malden, Lewis R. Hovey of Ipswich, Benjamin Parsons, Jr., of Georgetown, E. B. Fuller of Haverhill, with George A. Butman of Malden as Treasurer of the permanent organization, and E. B. Fuller of Haverhill as Clerk.

GREENSBURG, PA.—We are informed that the plans for the extension of the Greensburg, Jeannette & Pittsburgh Electric St. Ry. are not yet completed, and no propositions will be considered at present for the work. C. L. Brisner, General Manager.

GREENWICH, N. Y.—Joseph A. Powers, Lansingburgh, N. Y., promoter of the Greenwich & Schuylerville Electric RR., has made application for a franchise for his proposed electric railroad. The road is to go through Main St. to the Greenwich and Johnsonville depot. A hearing will be given on Jan. 27. (Jan. 20, p. 54.)

HAMILTON, O.—The Hamilton & Eaton Electric St. Ry. has secured a franchise for a 13-mile road through Hamilton County. J. H. Shellenbarger, J. A. Walker and C. F. Elliott are the parties who secured the franchise. (Dec. 30, 1898, p. 939.)

HUDSON, N. Y.—Charles Frisbee has secured right of way for an electric railroad from Albany to Hudson. The new company is known as the Columbia & Rensselaer Ry. & Lighting Co. The authorized capital is \$2,000,000, and the company is authorized to issue bonds for a like amount.

JACKSON, MISS.—The Jackson Electric Ry., Light & Power Co., which was incorporated Nov. 21, 1898, with a capital stock of \$125,000, is building the proposed 5½ miles of electric railroad. All contracts have been let and rolling stock required for the road has been purchased. Five open and five closed motor cars are to be used. The equipment of the power house consists of one 400 h. p. and one 250 h. p. Murray Iron Works Corliss engines and two 112 k. w. Westinghouse generators; two number 12 Brush arc dynamos, one 30-light Ft. Wayne arc dynamo and two A-70 General Electric Co. alternators for lighting purposes. F. G. Jones, Vice-President and General Manager of the Memphis St. Ry. Co. of Memphis, Tenn., is President and Purchasing Agent; S. T. Carnes, President of the Memphis St. Ry., is Treasurer, and Ralph Metzler is Chief Engineer of the company. (Jan. 13, p. 34.)

KANSAS CITY, MO.—According to report, the Brooklyn Ave. Ry. Co., which is now changing the line from cable to underground electric system, has bought the North East Electric Ry. for \$400,000. The N. E. is about nine miles long, and has never been a paying road. The roads are to be consolidated, and important improvements and extensions are contemplated. An ordinance has already been introduced in the City Council for a franchise on Grand from Third

to Thirteenth streets. J. H. Lucas is President of the B. A. Ry. An outline of the proposed work of changing the Brooklyn Ave. line from cable to electric was given in this column Apr. 1, 1898 (p. 246). George Linney, present Manager of the Brooklyn Ave., will be Manager of the new company, William C. Weaver of the N. E. retiring.

KENOSHA, WIS.—The Milwaukee, Racine & Kenosha Ry. Co., through Vice-president A. W. Bishop, has renewed its application for right of way through Kenosha. This road is believed to be a part of the system proposed between Chicago, Ill., and Milwaukee, Wis., known as the Chicago & Milwaukee Electric Ry.

LANSDALE, PA.—The Lansdale & Harleyville Ry. Co. is the name of the new company recently organized to build an electric railroad, with the following directors: M. C. Clemens, A. C. Godshall, Henry C. Delp, W. H. Godshall, Henry Albrecht, J. S. Geller, J. Rein Kehler and A. C. Alderfer. The capital stock is \$50,000. A. R. Place was appointed Attorney to make application for a charter, and secure right of way for the road. W. H. Godshall was elected temporary Secretary and Treasurer.

LANSING, MICH.—According to report, the Lansing, Dexter & Ann Arbor Electric Ry. has let contracts for building the proposed electric railroad. The work is to be begun as soon as the weather will permit. The road is to traverse one of the richest sections of the state, and will be 60 miles long. It is also stated that Eastern capitalists have taken a bond issue of \$1,800,000, and that the Westinghouse Co. is to build and equip the road. The officers are: C. P. Mapes, President, of Livingston, and Thomas Burkett, of Dexter, Treasurer. (Jan. 7, 1897, p. 17.)

LOGANSPORT, IND.—The County Commissioners have granted the Indianapolis & Logansport Traction Co. a 50-year franchise along the Michigan road to the north county line; the proposed electric railroad is to occupy the west side of the highway, and it is estimated that the entire work will cost \$1,000,000. Louis C. Walker, Indianapolis, is Counsel for the company. (Jan. 13, p. 34.)

MASILLION, O.—At a meeting of the City Council and other citizens recently a project was advanced to have the long-talked-of electric railroad to Navarre built by a bond sale. It is proposed to introduce a measure bonding the city in the sum of \$100,000, for building the road. The citizens of Navarre are expected to give their aid in every way to effect this construction. It is a part of the plan of the Massillon people to purchase, if possible, the Massillon City line from the Canton & Massillon Electric Ry.

MEDFIELD, MASS.—The Medfield & Medway Electric St. Ry. Co. has applied for a franchise in Medfield and a hearing will be given Jan. 25. The directors of this company are: Wilmot W. Mitchell, Joseph J. Feely, Harry L. Howard, Henry J. Dunn, Rufus G. Fairbanks, G. Haskell Bates, Chief Engineer, and Alfred C. Smith. It is reported that considerable trestle work will be needed for the proposed road.

MIAMI, FLA.—We are informed by Mr. J. A. McDonald that the project for building an electric railroad from Miami to points north and south has been abandoned for the present, and that he is no longer interested in the undertaking.

MILFORD, MASS.—While the petition from the Milford, Holliston & Framingham St. Ry. Co. asks only for a location for the proposed extension from East Main St. to Pine Grove Cemetery, the branch will probably be further extended. Work is to be begun on the extension as soon as the franchise is granted. W. B. Ferguson is President and Purchasing Agent.

MINNEAPOLIS, MINN.—The Twin City Rapid Transit Co. has made application in Stillwater for a franchise to build an extension through certain streets of that city. The contemplated plan of the company is to extend the present line between St. Paul and Wildwood to Stillwater, thence connecting Stillwater with the Twin City system. Thomas Lory, President; Calvin G. Goodrich, Vice-President, Secretary and Treasurer, Minneapolis.

MONACA, PA.—The Rochester & Monaca Electric St. Ry. Co. was chartered to build an electric railroad two miles long, connecting the boroughs of Bridgewater, Rochester and Monaca, in Beaver County. The capital stock is \$12,000. John T. Taylor (President), Monaca; W. James Stewart, William G. Taylor, Alexander T. Anderson and H. D. Anderson, Beaver, Pa., are the Directors.

MONTREAL, QUE.—The directors of the Montreal Street Ry. have decided to concentrate the whole of their business at the Hochelaza workshops of the company, in the suburbs of Montreal. The company will build in the spring a large brass foundry for the manufacture of their brasses, and a large iron foundry for the iron work required in connection with their vehicles, an important part of this being the car wheels, which they intend to manufacture for themselves in the future; the new buildings required for the work of centralization and expansion will involve an expenditure of \$500,000. It is understood that in future the company will not only build at Hochelaza the cars required for the Montreal system, but will also build the cars, etc., required by other companies in which it is interested.

MT. VERNON, N. Y.—The West Chester Electric RR. Co. has made application in the village of Pelham Manor for permission to build through the streets of that village to the boundary line of New Rochelle. The company recently filed an application with the Secretary of State for permission to make many extensions, of which this is one. (Jan. 13, p. 34.)

MYERSVILLE, MD.—Douglass Bros., Middletown, Pa., the contractors who built the Catoctin & Myersville Electric Ry., are reported as contemplating organizing a company to continue the road 26 miles to Hagerstown. The extension will only require the building of 8½ miles to Funkstown, where it will connect with the Hagerstown system. A preliminary survey will be made in a few weeks. (Jan. 13, p. 34.)

NATICK, MASS.—A petition has been made by the citizens to the Selectmen of Wayland requesting that the franchise asked by the Natick & Cochituate for an extension to the Boston & Maine station be granted. (Sept. 23, p. 697.)

NEW CASTLE, PA.—We are informed that no changes or improvements are contemplated in the lines of the New Castle Traction Co., as reported in this column last week. (Jan. 20, p. 54.)

PASADENA, CAL.—On Jan. 17 bids were opened for the sale of a franchise to build and operate a single track electric railroad in Pasadena. This franchise was asked for by the Los Angeles Terminal Ry., which offered for the franchise 75 per cent. of the receipts of the road. J. G. Rossiter, who is believed to be operating in the interest of the Southern Pacific, offered 100 per cent. of the receipts for the line, and presented the necessary bond of \$5,000 as a guarantee. The S. P. recently purchased the Los Angeles & Pasadena Electric Ry. (Jan. 16, p. 17; Los Angeles, Dec. 16, 1898, p. 905.)

PATERSON, N. J.—The Paterson Ry. Co. has made application to the Board of Aldermen to lay a double track on West street in the city, between Broadway and the West street bridge. Hobart Tuttle is General Manager.

PERTH AMBOY, N. J.—The Perth Amboy RR. Co., through Geo. M. Keasbey, has secured from the Common Council of Perth Amboy a franchise for this company, which was organized last October, with a capital stock of \$30,000. The proposed line will be three miles, with side track. The men chiefly interested in the Perth Amboy RR. are: Chas. J. Witterberg, and Leonard and Adolph Lewisohn, of New York City, who are the builders of the Raritan Copper Works at Perth Amboy. (Nov. 4, 1898, p. 805.)

PHOENIXVILLE, PA.—We are informed that the Montgomery & Chester Electric Ry. Co., which was chartered in Pennsylvania Dec. 9, and reported in this column Jan. 6 (p. 17) under Montgomery, Pa., will be a 15-mile electric railroad between Phoenixville, Spring City, Rogersford and Pottstown. The contract for building the road has already been let to the Fairmount Construction Co. of Philadelphia, and work is to be begun Feb. 1. Two iron bridges are needed on the line. The franchise is for 99 years, and the ordinance requires the company to finish the road within one year. John I. Ridgway of Philadelphia is President.

PITTSBURGH, PA.—The Wilkinsburg Borough Council, on Jan. 18, granted a franchise to the Edgewood & Swissvale St. Ry. Co., which is a branch of the Monongahela Traction Co., for right of way through certain streets in the borough. The company is to pay the borough \$15,000, which is to be used in making the necessary improvements on the streets through which the tracks pass. The fare within the borough limits is set at three cents, or 17 tickets for 50 cents. W. L. Mellon is President of the Traction Co. (Dec. 2, 1898, p. 869.)

QUINCY, MASS.—A hearing was given in Weymouth Jan. 7 on the application of the Quincy & Boston St. Ry. for the proposed road through the town from the Braintree line to the Hingham line. A. P. Worthen is attorney for the company. The Weymouth & Braintree Ry. is also endeavoring to secure right of way through the town. (Weymouth, Nov. 11, 1898, p. 821; Quincy, Dec. 30, 1898, p. 339.)

REVERE, MASS.—The company in which Geo. Forbush was recently reported interested is the Winthrop & Revere St. Ry. Co., which proposes to build from Boston to the Winthrop line. Application for a franchise was made in Boston Jan. 16. The route of the road through Boston is as follows: Beginning on Saratoga street, in Boston, near the tracks of the Boston, Revere Beach & Lynn, and then running through Saratoga street to the dividing line between Boston and the town of Winthrop. The road will be single track, with overhead trolley. Among those interested with Mr. Forbush are S. B. Hickley, Willard M. Bacon, S. B. Hickley, Jr. A hearing will be given Feb. 6. (Jan. 13, p. 34.)

RICHMOND, IND.—According to report, the following gentlemen are taking active part in the campaign to secure the building of new electric roads: Benjamin Starr, of the Starr Piano Co.; John Westcott, President of the Hoosier Drill Co.; John R. Rolling, H. C. Tanner and Perry J. Freeman. They will soon make a survey for a route 20 miles to Fair Haven, O.

ROCKFORD, ILL.—According to report, the Rockford Ry., Light & Power Co., which in November, 1898, was formed by the consolidation of the Rockford Traction Co. and the Rockford City Ry., has in contemplation several suburban extensions. The work on the line from Rockford to Belvidere is to be begun in the spring, the plans having been prepared. T. M. Ellis is President and Purchasing Agent.

ROME, N.Y.—John W. Boyle has made application to the City Council for a franchise to build an electric railroad. A public hearing will be given Feb. 6.

ST. LOUIS, MO.—John H. Blessing, of Gaylord, Blessing & Co., states that the Central Traction Co. will soon undertake to build the proposed railroad. The company has a franchise covering a great many streets in St. Louis. (Aug. 5, 1898, p. 71; Oct. 14, 1898, p. 751.)

SEATTLE, WASH.—A special committee of the City Council has been appointed to consider a report on the petition for the forfeiture of the franchise of the Seattle City Ry. Co., which now operates five miles of cable line on Yesler Ave. and Jackson St. It is proposed that a new 50-year franchise be offered for sale for the route which the S. C. now covers. The company has also submitted an ordinance asking for a 50-year franchise for a double-track cable line through Occidental Ave. to the lake, and an electric line through Thirtieth Ave., from Jackson to Occidental Ave. The company has been in receiver's hands for some time, and nothing has ever been done toward improving the line or reorganizing the company. W. A. Underwood, 40 Wall Street, New York, is receiver.

The citizens of Queen Anne Hill have applied to the Seattle Traction Co., and also to the West Seattle Cable Ry. Co., asking them to consider an extension. F. H. Osgood is General Manager of the Seattle Traction Co. and J. H. Watson, Manager of the Seattle Cable Ry.

John Collins and associates have secured a franchise in Seattle for part of the proposed electric railroad to Tacoma, the road to be completed and in operation by December, 1900. From Tacoma it is re-

WABASH.—This company has sold to J. & W. Seligman \$1,750,000 of its first mortgage 4% 40-year gold bonds, Des Moines Division.

WORCESTER, NASHUA & ROCHESTER.—The New York Mutual Life Insurance Co. is reported to have bought a controlling interest in the stock of this company. The line runs from Worcester, Mass., to Rochester, N. H., 94.48 miles, and is under lease to the Boston & Maine for 50 years, from Jan. 1, 1886, at \$250,000 per annum.

Electric Railroad News.

BALTIMORE, MD.—According to report, the negotiations for the consolidation of the street railroads in Baltimore have been completed, Alexander Brown & Sons having engineered the deal, which involved about \$20,000,000. (Dec. 23, p. 926.)

BOSTON, MASS.—We are informed that there has been no action of the stockholders of the North Shore Traction Co., or of the Board of Directors of that company, looking to the acquisition or consolidation of any electric railroads in the interest of that company. This company was organized to control various street railroad properties, and recent reports state that the N. S. T. was about to take over additional property. Cassius M. Wicker, 15 Wall St., New York City, is President.

BRADDOCK, PA.—W. L. Mellon has secured the Braddock St. Ry. for \$5,000 at the auction sale Jan. 20. It is probable that the road will be operated in connection with the Monongahela St. Ry., which is now building an extension to Braddock.

BROOKLYN, N. Y.—Brooklyn, Queens County & Suburban Ry. Co. first consolidated 5 per cent. gold bonds, payable July 1, 1941, to the amount of \$500,000, are being offered at 107 and accrued interest by Albert Loeb & Co., New York. The principal and interest is guaranteed by the Brooklyn Heights RR. Co., which is owned by the Brooklyn Rapid Transit Co.

The Directors of the Brooklyn Rapid Transit Co. have called a special meeting of the stockholders for Feb. 11, to authorize an increase of the capital stock from \$20,000,000 to \$45,000,000. This seems to be in line with recent reports that the company is to buy the Nassau Electric RR., for which negotiations have been pending for some time.

The Brooklyn Union Elevated RR. Co., according to report, has issued \$16,000,000 first mortgage bonds, preliminary to taking the road out of the hands of the receiver. Of this issue \$11,890,000 is to redeem old bonds, \$1,000,000 for electrical equipment, and \$3,000,000 for power and betterments.

BURLINGTON, IA.—The following officers were elected at the annual meeting of the Burlington Ry. & Electric Light Co., held Jan. 17: President, Col. G. H. Higbee; Vice-President, Hon. E. C. Walsh; of Clinton; Secretary, C. H. Walsh; Treasurer, J. T. Remey; Directors, J. J. Ransom, M. A. Walsh, J. W. Walsh, G. H. Higbee, E. C. Walsh, J. T. Remey and C. H. Walsh.

CHARLESTON, S. C.—According to report, the Baltimore Trust & Guaranty Co. has secured the Charleston City Ry. Co., the Charleston & Seashore Ry. Co., the Charleston Gas Co., and the Charleston Electric Light Co., and will consolidate them as one. It contemplates the issue of \$2,500,000 5 per cent. 100-year gold bonds for the retirement of the outstanding indebtedness of these companies, and for the operation of the companies under the new management. The Consolidated Railway, Gas & Electric Light Co. of Charleston, S. C., is reported as the name of the new company. The City Ry. has a mortgage indebtedness of \$840,000, bearing 5 per cent. interest. The Mercantile Trust & Deposit Co. of Baltimore are the trustees.

CHICAGO, ILL.—The Metropolitan West Side Elevated Ry. Co. was incorporated Jan. 17. This is the reorganized Metropolitan West Side Elevated RR., which was sold to the reorganization committee Jan. 4. The capital stock of the new company is \$16,500,000, of which \$9,000,000 is preferred stock and \$7,500,000 common stock. The incorporators are: Dickinson McAllister, Wm. E. Baker, Wm. W. Curley, Ira C. Wood, Will H. Clark, Hiram I. Keck and Addison L. Gardner, all of Chicago; Howard M. Carter, of Evanston, and George Higginson, Jr., of Winnetka. (Jan. 13, p. 36.)

CINCINNATI, O.—At the annual meeting of the Cincinnati, Newport & Covington St. Ry. Co., Jan. 12, Henry Burkhold, Cashier of the Franklin Bank, was elected a director, succeeding M. M. White, resigned.

CLEVELAND, O.—At the annual meeting of the Cleveland Electric Ry. Co., Jan. 17, Henry A. Everett was elected President, succeeding Horace E. Andrews, resuming the position from which he was deposed by Tom. L. Johnson four years ago. Chas. L. Pack is now Vice-President, he having been elected to succeed J. Parmelee.

DAYTON, O.—The Dayton Traction Co., at the annual meeting, Jan. 11, elected the following directors: J. A. McMahon, S. J. Patterson, W. A. Stern, J. Sprigg McMahon, Max. B. May, A. Israel and I. A. Silverman. The officers are as follows: President, John A. McMahon; Vice-President, S. J. Patterson; Treasurer, W. A. Stern; Secretary and Treasurer, J. Sprigg McMahon. A number of improvements have been decided upon.

DECATUR, ILL.—On petition of the American Trust & Savings Bank, of Chicago, Judge Vail has appointed Wm. L. Shellabarger receiver of the City Electric Ry. Co., his bond being fixed at \$50,000. The petition for the appointment of the receiver sets forth that default has been made in the payment of interest since March 1, 1898. In November last year the company paid a 12 per cent. dividend, covering a period of two years. This company was chartered in 1891 for 20 years, and in 1892 was consolidated with the Decatur Electric St. Ry. and the Citizens' Electric St. Ry. The capital stock of the company is \$300,000, and the bonded indebtedness is \$175,000, drawing interest at the rate of 6 per cent.

DENVER, COLO.—The Colfax Electric RR. was sold for \$5,000 by Geo. E. Ross-Lewin to the Denver Consolidated Tramway Co., on Jan. 15. Nov. 1,

1898, Judge Palmer ordered the road sold, the company having been in default of interest since 1891. In November last it was reported that the Colfax, which is 10½ miles long, was endeavoring to consolidate with other Denver street railroad companies. The capital stock of the Colfax is \$150,000, and there is a first mortgage on the property of \$150,000, which will mature Jan. 1, 1911. The S. T. Co., the purchasing company, is one of the companies to consolidate and form the new Denver Consolidated Traction Co. (Jan. 13, p. 36.)

DOYLESTOWN, PA.—Application has been made by John B. Stevenson, of Philadelphia, for a receiver for the Bucks County Ry. Co., which operates an electric railroad between Doylestown and Willow Grove. A hearing has been set for Jan. 28. This company was chartered in 1894 with an authorized capital stock of \$100,000. Francis Fenimore, St. David's, Delaware county, Pa., is President.

GREEN BAY, WIS.—At the foreclosure sale of the Fox River Electric Ry., Jan. 14, the property was bought in by Chas. E. Vroman, for the security holders, for \$75,000. A company was recently organized to buy in the property. (Dec. 16, p. 906; Dec. 23, p. 926.)

HAMILTON, O.—At the annual election in Dayton of the Cincinnati & Miami Valley Traction Co., several changes were made in the directors. Judge O. B. Brown, Vice-President of the C. & M. V. T. and Vice-President and Treasurer of the Dayton Traction Co., resigned. J. A. McHone was elected his successor. Max. B. May was elected Vice-President; W. A. Stern, Treasurer, and J. S. McMahon, Secretary. The following were elected directors: Hon. John A. McMahon, of Dayton; Max. B. May, of Cincinnati; A. Israel, of New York; I. A. Silverman, of Philadelphia, and Peter Schwab, of Hamilton. A number of improvements have been decided upon.

INDIANAPOLIS, IND.—For some time negotiations have been in progress for consolidating the City St. Ry. Co. and the Citizens' St. RR. Co., of Indianapolis, the greater portion of which stock is held by Philadelphians. Wm. J. Turner, 929 Chestnut St., Philadelphia, represents the Citizens' Co. Jas. Murdoch, of Lafayette, is conducting the negotiations for the City Co. The consolidation will involve about \$10,000,000.

KOKOMO, IND.—Chas. L. Harry, as receiver for the Kokomo St. Ry. Co., gives notice that on Jan. 28 he will sell all the property and real estate of the company, together with the equipment, at the company's office, 22 East Sycamore St., Kokomo. Mr. Harry was recently appointed receiver of the Kokomo City Ry. Co. (Jan. 20, p. 56.)

LEXINGTON, KY.—Notice has been given to the stockholders of the Passenger & Belt Ry. Co., the Belt Electric Line Co., the Central Electric Co. and the Hercules Ice Co., that a plan has been agreed upon for the consolidation of these companies into a single corporation, the consolidation to be effective from Feb. 1. T. D. Murray is Secretary of the Belt Electric Line.

MONTREAL, QUE.—The Montreal Incline Electric St. Ry., at the annual meeting, elected the following officers and Directors: W. Mann, President; F. B. McNames, Vice-President, and Messrs. Murdock, McKenzie, Fayette Brown and James Williamson, Directors, with W. G. Turner, Secretary-Treasurer. Application has been made to the Montreal City Council asking a renewal of the contract, which expires in 1900. For some time it has been reported that the city would buy the road on the expiration of the franchise.

NASHVILLE, TENN.—The Nashville St. Ry. gives notice that after Jan. 31 the company is ready to pay certain bonds of the South Nashville St. RR. Co. J. C. Bradford, Vice-President. (Dec. 9, 1898, p. 888.)

NEW PHILADELPHIA, O.—The Tuscarawas Electric Co., which operates an electric railroad between New Philadelphia and Urichsville, has been sold. David King, of Canal Dover, O., is reported as having been appointed Superintendent under the new management.

NEWPORT NEWS, VA.—The Newport News & Old Point Ry. & Electric Co. has filed a bill against the city for an injunction restraining it from revoking the company's franchise, which was ordered done by the Common Council Jan. 5. (Jan. 20, p. 56.)

PALMER, MASS.—At a meeting of the Palmer & Monson Electric Ry. Co., held Jan. 7, it was voted to issue bonds to the amount of \$60,000 for the proposed extension of the line to Monson, Ware and West Warren, and also to increase the capital stock \$35,000, making it \$90,000. The State Railroad Commissioners last July approved the increase of the capital stock.

READING, PA.—Chas. H. Schaeffer, who was appointed Master to report upon the dispute of the recent annual election of the Reading & Southwestern Ry. Co., confirms the election of Geo. W. Keim as President, and the other officers as reported in this column Jan. 13 (p. 36).

RICHMOND, VA.—The Directors of the Richmond Traction Co., at a meeting Jan. 19, amended the by-laws so as to increase the capital stock from \$3,000,000 to \$6,000,000. J. Skelton Williams is President.

RUTHERFORD, N. J.—The reorganization committee of the Union Traction Co. of New Jersey, composed of G. W. McCormick (chairman), W. G. Street, F. M. Pierce and Wm. C. Giles, give notice that a majority of the outstanding first mortgage bonds have been deposited under the plan and agreement of the reorganization dated July 12, 1898, and which is now declared operative. No other deposits will be received after Jan. 25. (Rutherford, Nov. 25, p. 854; Jersey City, Jan. 6, p. 18.)

ST. LOUIS, MO.—The Union Depot RR. Co., which was chartered in 1885, has been sold to Eastern capitalists represented by Brown Bros., for \$4,100,000. Harry Scullin, Vice-President of the U. D., and Jas. Campbell, a heavy stockholder in the company, conducted the negotiations of the company. Brown Bros. recently secured the Lindall Ry. and subordinate lines, which gives them possession of about two-thirds of the street car mileage in that city, and this purchase is believed to be a part of

the plan of the consolidation of all the street railroads in that city. The U. D. RR. Co. has a capital stock of \$4,000,000. It operates 73 miles of electric railroad. The company has been paying 6 per cent. annual dividends.

SEATTLE, WASH.—At the annual meeting of the stockholders of the First Ave. Ry. Co., Jan. 13, Maurice McMicken retired as President, and was succeeded by Col. M. H. Heck, of San Francisco, Cal. The First Ave. Ry. is the successor to the Front St. Cable Ry., which was sold at foreclosure in January, 1898.

WILMINGTON, N. C.—A bill has been introduced into the General Assembly of North Carolina to incorporate the Wilmington Gas Light Co., which is to be a consolidation of the Wilmington St. Ry. and the Wilmington Sea Coast Ry. The capital stock is not to exceed \$500,000. The Wilmington St. Ry. was chartered in 1887 for 50 years. It has a capital stock of \$100,000 and a mortgage with the State Trust Co. of New York, of \$150,000, bearing 6 per cent. interest, which will mature in 1920. The act for the consolidation of these companies is to take effect upon ratification.

WORCESTER, MASS.—The stockholders of the Worcester Traction Co. held their annual meeting in Newark, N. J., Jan. 19, electing the following officers: President and Secretary, Thomas C. Barr, of Newark; Vice-President, C. Howard Clark, Jr., of Philadelphia; Treasurer, E. J. Moore, of Philadelphia. Board of Directors, Thomas C. Barr, A. George Bullock, of Worcester, Mass.; C. Howard Clark, Jr., Francis H. Dewey, of Worcester; Albert H. Stone, of Worcester; Cassius M. Wicker, of New York, and Stephen Salisbury, of Worcester.

TRAFFIC.

The St. Johnsbury & Lake Champlain Railroad now issues thousand-mile tickets at \$20 each. The company protests against the law, passed at the last session of the Legislature, requiring the sale of mileage tickets at this low rate, and an appeal will be taken to the courts.

The Southern Railway, the Seaboard Air Line and the Central of Georgia have been making frequent and large reductions in rates on cotton from Atlanta to the seaboard. To Norfolk the rate fell in one week from 49 cents to 25 cents. Rates on other commodities have also been reduced in some cases.

Chicago Traffic Matters.

Chicago, Jan. 25, 1899.

Not in twelve years have passenger and freight rates from this city to the East been maintained at tariff as they are now. Local officers of the east-bound lines have received orders from their superiors that under no circumstances must passenger or freight rates be deviated from one cent for the benefit of anybody. To these orders there are no strings nor double meanings. They mean just what they say and they are being obeyed like army commands. Whether it is the declarations of the Baltimore & Ohio and the Big Four that they will give the commission any cut-rate evidence they may secure, or simply the conferences of the presidents, or whatever the cause, a very novel condition exists. In addition to the maintenance of rates at tariff, all forms of concessions have been cut off. Passes and half-rate tickets, disguised as "charity," heretofore the prey of city hall politicians, have been totally wiped out. Since the presidents' rate-bracing orders were received in this city, there have been continual meetings of local officers to get the tracks clear of all inside contracts. General Passenger Agent Roberts, of the Erie, came on from New York a day in advance of the Central Passenger Association meeting to hold a conference with his outside agents and to give one and all imperative orders that to cut a rate meant dismissal. In addition to this, Mr. Roberts has issued a circular to connecting lines to the effect that the Erie Railroad assumes full responsibility for the maintenance of tariff rates on its tickets from points in Trunk Line territory to destination and that under no circumstances will the company countenance any reduction in rates by the payment of commission to the selling agent or allowance to the passenger. As the Erie has done about as it pleased with rates since last August, Mr. Roberts' action is significant. As further proof that the presidents "mean business" announcement is just made by the Trunk Line Association that an excess fare of \$1 per hour saved will be charged on all westbound trains making the run between New York and Chicago in less than 28 hours.

The trunk lines have authorized a reduction in corn rates from Chicago to New York [See editorial page.—Editor]. Provision rates from here to the East are also to go down from 30 cents to 25 cents per 100 lbs., and the charge on live cattle and hogs also will probably be materially lowered. As a matter of fact, the new rates, if adhered to, will be advances, instead of reductions, as the rates that have been quoted on this traffic during the last three or four months have been far below the proposed open reductions.

A statement of the export traffic of the 10 competing roads from Chicago to New York has just been issued by the Central Freight Association. Like all statements from this organization, the figures include the traffic from all Chicago junctions and from all Elgin, Joliet and Eastern connections, as well as from Chicago proper. Following are the figures:

	Tons.	P.C.
Baltimore & Ohio.	203,819	9.4
Cleveland, Cincinnati, Chicago & St. L.	261,808	12.1
Chicago & Erie.	232,829	10.8
Chicago & Grand Trunk.	188,221	8.7
Lake Shore & Michigan Southern.	323,534	15.0
Michigan Central.	265,332	12.3
New York, Chicago & St. Louis.	161,507	7.5
Pittsburg, Cincinnati, Chicago & St. L.	206,717	9.6
Pittsburg, Ft. Wayne & Chicago.	219,534	10.2
Wabash.	95,947	4.4
Totals.	2,159,248	100.0
Total, 1897.	1,112,962	

The Santa Fe has cut one-half hour off the running time of its passenger and mail train leaving Chicago at 10 p. m. The train now leaves at the same time and arrives in Kansas City at 10:30 a. m., or 12½ hours out. The Santa Fe is the shortest line between Chicago and Kansas City by 30 miles, the distance being 458 miles.